

EPSON

420*i*

**HIGH SPEED
BUSINESS PRINTER**

**USER'S
GUIDE**

EPSON AMERICA INC. *SERVICE DIVISION*

EPSON
420i
HIGH SPEED BUSINESS PRINTER

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Computer Products Division
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WARNING:

“This equipment has been certified to comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of FCC Rules. Only computers certified to comply with the Class B limits may be attached to this printer. Operation with noncertified computers is likely to result in interference to radio and TV reception.”

“This equipment generates and uses radio frequency and if not installed and used properly, that is, in strict accordance with the manufacturer’s instructions, may cause interference to radio and television reception. It has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that computer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

“How to Identify and Resolve Radio-TV Interference Problems.”

This booklet is available from the US. Government Printing Office, Washington, D.C. 20402, Stock No. 004-000-00345-4.

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INTRODUCTION

The Epson 420i is a high speed business printer which is usable with almost all commercial software, including word processing and graphics programs. By changing one switch on the back of the printer, either the Epson Printer mode or the IBM Graphics Printer mode is selectable. The two modes differ in character sets and some printer commands.

In contrast with the IBM Graphics Printer, the Epson 420i prints italic characters. Most programs written for the IBM Graphics Printer do not attempt to print them.

The IBM Graphics Printer mode is selected when extended characters are to be used, or when software is limited for use with the IBM Graphics Printer.

Refer to the sections titled "DIP Switch Setting" (page 26), "Code Table" (pages 30 through 32) and "Differences between the Epson Printer Mode and the IBM Graphic Printer Mode" (page 36) for details on use of each mode.

PRECAUTIONS FOR USE

- When using fan fold paper, the friction lever should be positioned to the front.
- Do not apply undue force to the transparent printer cover.
- Do not use a power supply voltage which is out of the specified range.
- Do not touch the printhead immediately after printing because it is too hot.
- Never close the openings of the upper enclosure or place the printer where these openings are next to a wall.
- Be careful not to twist the ribbon while installing it.
- Insert the ribbon between the ribbon guide and the printhead as shown in Figure 3.
- Wait at least two seconds after turning power off before turning it back on again. The initialization process may not be performed correctly if this is not done.
- The printer should be used where the humidity is low, there is little dust, and where it is not in direct sunlight.
- Do not perform printing without the ribbon cassette and paper properly installed.

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CONTENTS

OUTLINE	1
SWITCHES AND LAMPS	4
REPLACEMENT OF THE RIBBON CASSETTE	6
PAPER SETTING	9
MAIN FUNCTIONS	13
PARALLEL INTERFACE	18
SERIAL INTERFACE	22
DIP SWITCH SETTING	26
CODE TABLE	30
CONTROL CODE SUMMARY	33
PRINT MODE FLOWCHART	37
CONTROL CODE EXPLANATION	38
PROGRAM EXAMPLES	50
APPENDIX	77

OUTLINE

PRINTING OPERATION

1. Printing Method

Impact dot matrix
Bidirectional logic seeking printing

2. Printhead

8 Pins

3. Character Fonts (140 characters in each font)

Standard
Italic
High quality (correspondence)
Italic high quality
Superscript / subscript
Italic superscript / subscript
IBM graphics fonts

4. Graphic Printing

	Horizontal x Vertical		
Standard	n	x 8	(maximum value of n is 816)
Double-Density	n	x 8	(maximum value of n is 1632)
High-Density	n	x 16	(maximum value of n is 1632)

5. Print Mode

Any one of 17 fonts may be selected from the five available print modes. Each font may be used exclusively or intermixed within any given line. When a mode change is indicated, data already input is printed in the mode first selected, the printer skips a few spaces, changes modes, and then receives new data.

Speed of printout (CPS) is slightly different in each mode depending on operational complexity, e.g., the bold print and double-strike modes are created with two passes of the printhead, thus requiring a slightly greater printout time.

See the "Detailed Summary of Character Fonts" Table on page 2 for print specifications and CPS for each mode.

Detailed Summary of Character Fonts

Print Mode	Character Font	Character Structure (HxV + space)	Maximum Number of Columns	Character Spacing CPI	Printing Speed CPS	Minimum Dot Spacing (H x V in inches)	Character Dimensions (H x V in mm)	Number of Passes
1	Standard pica	*12 x 8	136	10	417	1/120 x 1/60	2.1 x 2.9 (*9 x 7 dot)	1
	Italic pica	*12 x 8	136	10	417	1/120 x 1/60	2.5 x 2.9 (*11 x 7 dot)	1
	Standard graphic	n x 8	816 dot column	—	2500 dot column/sec	1/60 x 1/60	—	1
	Double-density graphic	n x 8	1632 dot column	—	2500 dot column/sec	1/120 x 1/60	—	2
2	Standard elite	*12 x 8	163	12	417	1/144 x 1/60	1.8 x 2.9 (*9 x 7)	1
	Italic elite	*12 x 8	163	12	417	1/144 x 1/60	2.2 x 2.9 (*11 x 7)	1
3	Standard condensed	*12 x 8	217	16	417	1/192 x 1/60	1.5 x 2.9 (*9 x 7)	1
	Italic condensed	*12 x 8	217	16	417	1/192 x 1/60	1.7 x 2.9 (*11 x 7)	1
4	High quality pica	*24 x 16	136	10	104	1/240 x 1/120	2.1 x 2.9 (*17 x 13)	2
	High quality italic pica	*24 x 16	136	10	104	1/240 x 1/120	2.1 x 2.9 (*17 x 13)	2
	High quality proportional	*n x 16	—	—	—	1/240 x 1/120	2.1 x 2.9 (*17 x 13)	2
	High quality italic proportional	*n x 16	—	—	—	1/240 x 1/120	2.1 x 2.9 (*17 x 13)	2
	Superscript/subscript	*12 x 8	272	20	208	1/240 x 1/120	1.2 x 1.7 (*9 x 7)	2
	Italic superscript/subscript	*12 x 8	272	20	208	1/240 x 1/120	1.5 x 1.7 (*11 x 7)	2
	High density graphic	n x 16	1632 dot column	—	1250 dot column/sec	1/120 x 1/120	—	2
5	High quality elite	*24 x 16	163	12	104	1/288 x 1/120	1.8 x 2.9 (*17 x 13)	2
	High quality italic elite	*24 x 16	163	12	104	1/288 x 1/120	1.8 x 2.9 (*17 x 13)	2

* Includes half dot.

6. Paper Feed Function and Form Width

Pin feed method (form width may vary) 5"-15.5"

Friction feed method 11"

7. Line Feed Pitch

Minimum 1/180"

8. Line Feed Speed

60 lines/second - when 6 lines/inch is selected

75 lines/second - when 7.5 lines/inch is selected

9. Copies

Original plus 4 copies, non-carbon, total thickness 0.3mm or less

10. Ribbon

Cassette style, single color

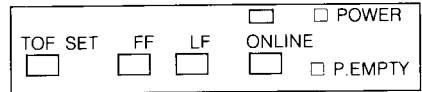
Other Specifications

- | | |
|-----------------------------------|--|
| 1. Power Supply | 117VAC \pm 10%, 220-240VAC \pm 10%, 50/60Hz |
| 2. Temperature (during operation) | 5°C - 40°C (41°F - 104°F) |
| 3. Humidity (during operation) | 20% - 80% |
| 4. External Dimensions | 595 mm (width) x 194 mm (height) x 405 mm (depth)
(23.4 x 7.6 x 15.9 inches)
(The depth is 580mm when the paper rack is attached.) |
| 5. Weight | 27kg (60lb) |
| 6. Power Consumption | Printing 250 watts
Stand-by 5.5 watts |

SWITCHES AND LAMPS

1. POWER Switch

The power switch is located at the rear, right-hand side of the printer.



2. ON-LINE Switch

Pressing this switch selects either ON-LINE (green indicator on) or OFF-LINE (green indicator off) state. If in the OFF-LINE state, the printer outputs a busy signal. The print-head returns to the home position when entering the ON-LINE state from the OFF-LINE state.

3. LF Switch (LINE FEED)

Each time this switch is pressed, a 1/6 inch line feed is performed. If held down, continuous line feeds are performed. This command is valid only in the OFF-LINE state.

Note: Refrain from performing continuous line feed for one minute or more. It may affect the longevity of the line feed motor.

4. FF Switch (FORM FEED)

If the FF switch is pressed in the OFF-LINE state, a one page form feed is performed. The page length is selected by the FORM dial switch or by code designation.

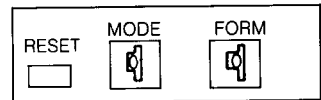
5. TOF SET Switch (TOP OF FORM)

If the TOF SET switch is pressed in the OFF-LINE state, the existing paper position becomes the TOP OF FORM. The page length is designated by the FORM dial switch. The buzzer sounds for 0.1 second after this switch is pressed.

6. FORM Dial Switch

This switch selects the length of the page. If the switch is set to "0", the page length designated by an external device code, becomes valid. The page length can be altered by pressing the TOF SET switch in the OFF-LINE state. A page length of 11 inches is automatically selected when the TOF SET switch is pressed for a dial setting of "0".

Dial	Page Length	Dial	Page Length
0	CODE SET	5	14 INCH
1	8 INCH	6	15 INCH
2	8.5 INCH	7	16 INCH
3	11 INCH	8	17 INCH
4	12 INCH	9	22 INCH



7. MODE Dial Switch

Each character font may be selected by this switch.

Dial	Code	Selected Character Font
0	CODE SET	Software Selection
1	10 STD	Standard Pica
2	12 STD	Standard Elite
3	16 STD	Standard Condensed
4	PROPORT	High Quality Proportional
5	10 CRSPN	High Quality Pica
6	12 CRSPN	High Quality Elite
7	10 ITALIC	High Quality Italic Pica
8	12 ITALIC	High Quality Italic Elite
9	10 BOLD	Standard Pica Bold Printing

Settings 1 to 9 have priority over the software designation. Software selection will be ignored after setting this switch to 1~9. If the switch selection is altered during printing, it will become effective after the current print command is executed.

8. RESET Switch

When this switch is pressed, the printer enters the reset state. When released, the initialization operation is performed once again, This puts the printer in the same condition as at power-on.

9. POWER Lamp (Green)

Lights up when power is on. Blinks if an error has been generated.

10. ON-LINE Lamp (Green)

Data can be input when the printer is the ON-LINE state. The ON-LINE lamp is lit when the printer is ON-LINE, off when the printer is OFF-LINE. When the printer is OFF-LINE, a BUSY signal is output by the printer.

11. P. EMPTY Lamp (Red)

When a paper-empty signal is detected, the P.E. indicator lights and the buzzer sounds for 3 seconds. At this time, the printer goes OFF-LINE, and the BUSY and P. EMP signals are output. If paper-empty is detected during printing, operation is terminated at completion of the line in which the signal is received.

If the ON-LINE switch is pressed after paper is inserted, the P. EMP state is terminated. If the ON-LINE switch is pressed without new paper inserted, a single line is printed (during printing the ON-LINE lamp is lit) and the OFF-LINE state is entered again. This operation can be repeated as many times as desired.

RIBBON CASSETTE REPLACEMENT

Installing the Ribbon Cassette

1. Open the printer cover and push the paper pressure bar toward the platen as shown in Fig. 1.

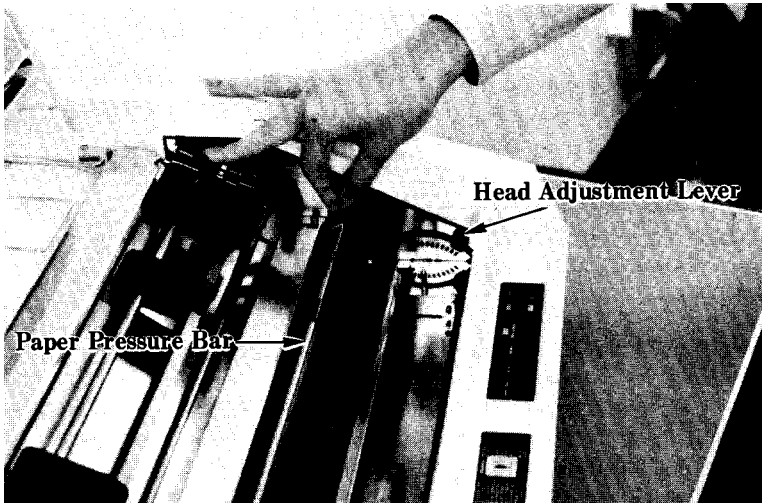


Fig. 1

2. Set the head adjustment lever all the way forward. This lever may be moved easily by pushing it outward.

3. To attach the ribbon cassette to the printer, hold the ribbon cassette knobs in both hands and press the ribbon into position between the ribbon mask and the printhead. Make sure that the ribbon is not twisted.

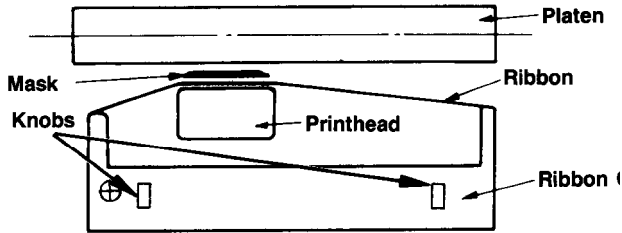


Fig. 2

4. Tighten the ribbon by twisting the ribbon feed knob in the direction of the arrow (Fig. 3). Make sure that the ribbon is properly positioned in the guide as shown below.

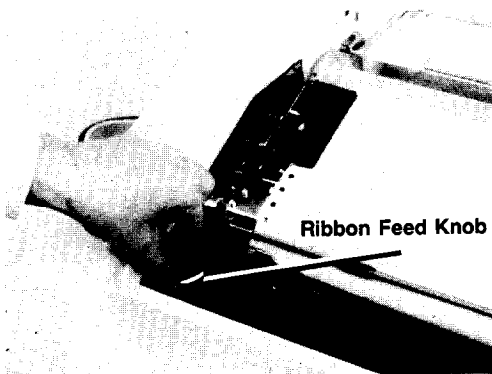


Fig. 3

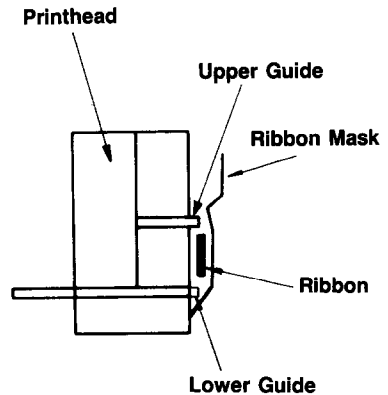


Fig. 4

5. The installation is complete once the head adjustment lever has been returned to position 2, 3 or 4, any of which is a position for a single sheet of paper. The higher the number that the lever is set on, the greater the distance between head and platen. This greater distance is desirable since it reduces ribbon wear.

Removing the Ribbon Cassette

1. Push the paper pressure bar towards the platen side. Pull the head adjustment lever forward.

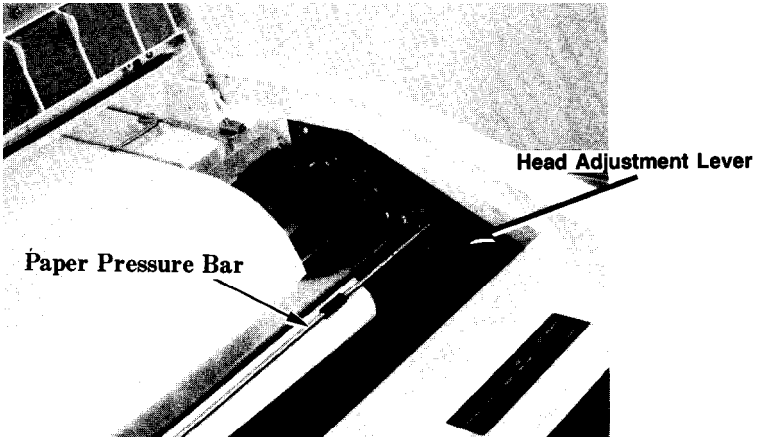


Fig. 5

2. As shown in Fig. 6, hold the ribbon cassette in both hands and pull the ribbon cassette upward.

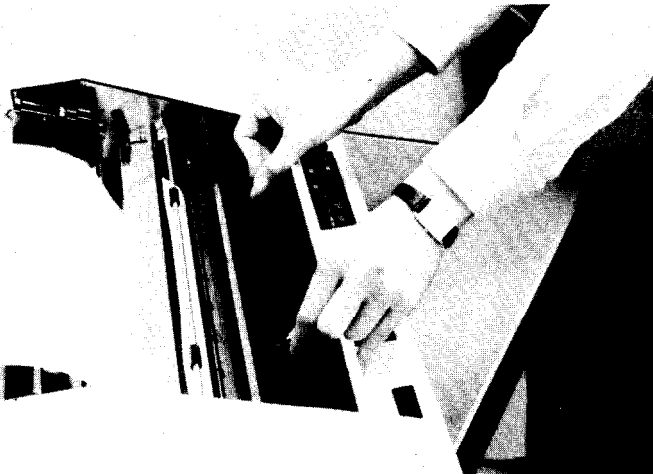
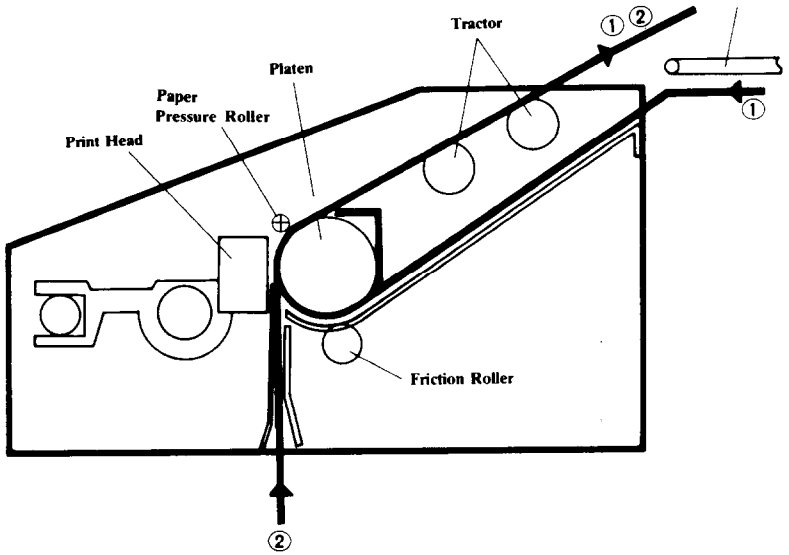


Fig. 6

PAPER SETTING



1. Rear feed (friction/tractor type)-used for fan-fold, multiple copy sheets
2. Bottom feed (tractor type)-used for fan-fold, multiple copy sheets

Fig. 7

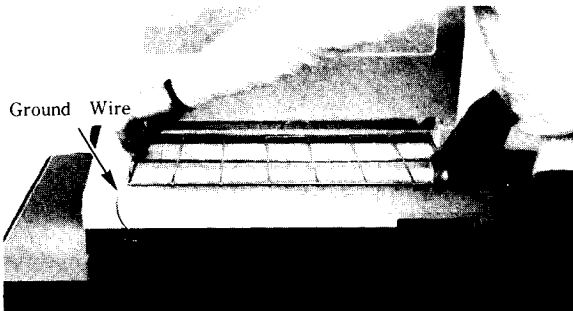


Fig. 8

Rear Feed Tractor Paper Setting

1. Attach the paper rack to the rear of the printer by inserting it into the two holes located there, as shown in Fig. 8. Connect the ground wire. It is located between the paper rack and the power cable receptacle's right-hand screw (shown in Fig. 8). Failure to do so may cause malfunction of the printer. The purpose of this ground connection is to eliminate static electricity formed by the paper.

2. Pull the paper pressure bar forward. Pull the tractor forward until it clicks. At this time make sure that the friction lever is in the forward position marked as "PIN FEED." (The form is free to move.)

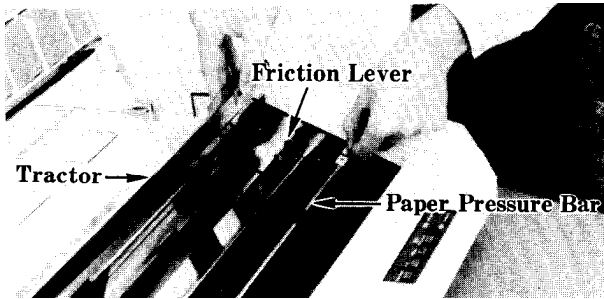


Fig. 9

3. Insert the paper into the back of the printer following the paper feed path 1 as shown in Fig. 7.



Fig. 10

4. Push the tractor into its original position (until it clicks). If the tractor lock levers, located at either side of the tractor shaft, are pushed up as shown in Fig. 11, the tractor can be moved horizontally to adjust it to match the width of the form being used.

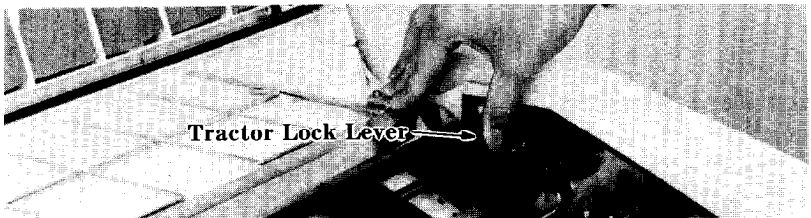


Fig. 11

5. Open both tractor lids, adjust the form holes so they match the tractor pins, and then close the tractor lids.
6. Determine the proper horizontal positions of the tractors, and then pull the tractor lock lever forward to lock it into this position.

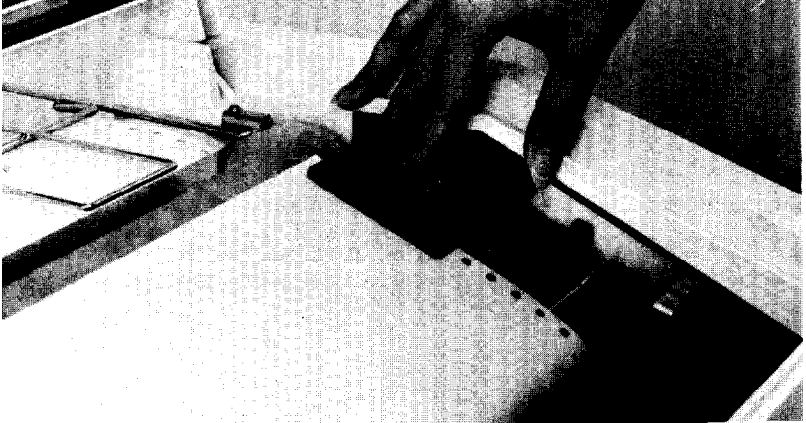


Fig. 12

7. Push the paper pressure bar towards the platen
8. For one part fan fold paper, the head adjustment lever is usually set at position 2. However, when printing an original plus 4 copies, it should be moved 3 or 4 clicks forward.
9. As shown in Fig. 13, the side stoppers located at each side of the paper rack's form feed roller should be adjusted to match the width of the form being used.

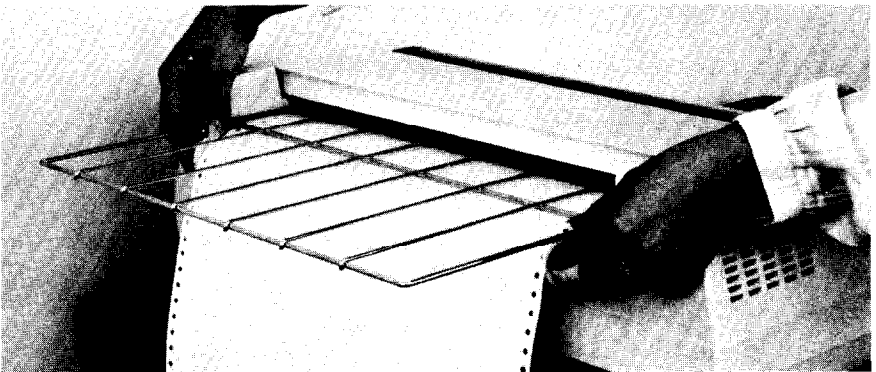
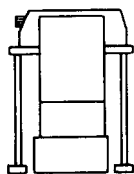
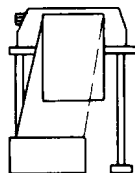


Fig. 13

Note 1: Recommended paper position is shown below.



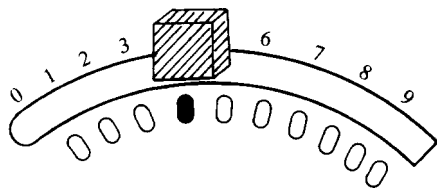
CORRECT



INCORRECT

Failure to position the paper correctly as shown above may result in a paper jam.

Note 2: The head adjustment lever on the right base plate is used to find the best printing quality by shifting it back and forth in line with the paper thickness.



Bottom Feed Tractor Paper Setting

The bottom feed tractor paper setting is illustrated as path 2 in Fig. 7. Because the form is fed in from the bottom, a special type of desk is required.

1. Pull the paper pressure bar forward and make sure that the friction lever is also in the forward position marked "PIN FEED". (Fig. 9)
2. Insert the form as done for path 2 of Fig. 7
3. Move the tractor lock lever upward. (Fig. 11)
4. Perform steps 5-8 for the rear feed tractor type (path 1).
5. Move the side stoppers, located at the bottom of the printer at the paper insertion opening, to match the width of the paper to be used.

MAIN FUNCTIONS

Detection Functions

1. Cover Switch

The printer cover open/close detection switch puts the printer in the OFF-LINE state. It outputs a BUSY signal when the cover is opened. If the cover is opened during printing, printing is terminated after the current line is finished, and the OFF-LINE state is entered. When the cover is closed and the ON-LINE switch is pressed, the ON-LINE state is entered and printing is resumed. For easier paper and ribbon installation, the printhead moves to the position which is approximately 10 cm away from the home position when the printer cover is opened.

2. Right Overrun Switch

This switch detects the printhead carrier when it reaches the right most limit.

3. Temperature Detection Function

This detector recognizes abnormal temperature levels within the printer.

Note: In the case of 2) or 3) if an abnormality is detected, the ERROR and BUSY signals are output. The printer mechanism's power supply is also turned off. To reset this condition, an INITIAL signal must be input, the RESET switch pressed, or power must be turned off and then on again.

Errors	Buzzer and Power Lamp Blinking
<ul style="list-style-type: none"> Abnormal temperature rise Pin fires abnormally 	
<ul style="list-style-type: none"> Head carrier overrun error 	
<ul style="list-style-type: none"> Home sensor 	
<ul style="list-style-type: none"> RAM error Address (0000) H (3FFF)H 	
<ul style="list-style-type: none"> RAM error Address (4000) H (7FFF)H 	

You can identify which section is malfunctioning by the buzzer sound or POWER lamp blinking as shown above.

SELF TEST PRINT EXAMPLE (EPSON MODE)

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

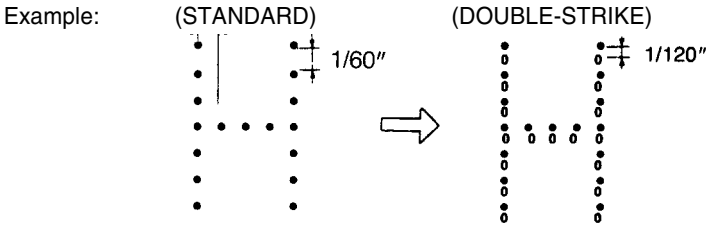
!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*X+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNopqrstuvwxyz[\]^_`abcdefghijklmnopqrstuvwxyz{|}~"AAA&éèèèèè#0B`Dµ\$A&öüüüüü#èçš†↓↔→δi;ǃNRRÆøø[\]^`8Ç*~" (|)"

Double-Strike Printing

In the double-strike mode, the second dot is printed 1/120 inch down from the initial dot on a vertical line. The double-strike process requires 2 passes of the printhead.



Buffer

This printer is equipped with an 18K-byte communication buffer which allows the reception of data during printing. Thus, even for large data transfers the computer is free to perform other tasks.

Printhead Protection

During high-density printing, a heat detector within the printhead protects the coils from damage due to overheating, by reducing print speed. The sensor recognizes two temperature warning levels. At level one, a 200 ms pause in the print cycle occurs before the next line is printed. At temperature level two, a 5-second pause in the print cycle will occur, allowing the heat to dissipate. The ON-LINE lamp blinks during the 5-second halt.

RAM (Memory) Error Detection

(performed only during the initialization operations)

When a RAM error is detected, the buzzer sounds, the POWER lamp blinks, and the error state is entered.

PARALLEL INTERFACE

Input Connector

Cable side connector
 Printer side connector
 Signal Diagram

DDK 36 pin 57-30360-D8 or equivalent
 DDK 36 pin 57-40360-12 or equivalent

PIN	SIGNAL	IN/OUT	PIN	SIGNAL	IN/OUT
1	$\overline{\text{STROBE}}$	IN	19	GND	
2	DATA 1	IN	20	GND	
3	DATA 2	IN	21	GND	
4	DATA 3	IN	22	GND	
5	DATA 4	IN	23	GND	
6	DATA 5	IN	24	GND	
7	DATA 6	IN	25	GND	
8	DATA 7	IN	26	GND	
9	DATA 8	IN	27	GND	
10	ACK	OUT	28	GND	
11	BUSY	OUT	29	GND	
12	P.EMP	OUT	30	GND	
†	HIGH		31	INITIAL	IN
‡	GND		32	$\overline{\text{ERROR}}$	OUT
	NC		33	GND	
	GND		34	NC	
	CHASSIS GND		35	NC	
	NC		36	NC	

† Note 1: High is connected through a 1k Ω pull-up resistor to +5V.

‡ Note 2: NC stands for lines not connected.

Signal Descriptions

1. Input Signals to the Printer.

* DATA 1-DATA 8

8-bit data signal, with "1" being HIGH.

* $\overline{\text{STROBE}}$

Strobe signal used to read 8 bits of data. Data is input when the signal is LOW.

* INITIAL

Puts the printer into its initial state. This signal is usually HIGH. When it goes LOW and then HIGH again, the printer is initialized.

2. Signals from the Printer

* BUSY

This signal shows that the printer is in the BUSY state. When it is HIGH, data cannot be received. The following are conditions for which a HIGH BUSY signal is output:

- (a) While performing initialization operations. _____
- (b) While the printer is inputting data with the STROBE signal.
- (c) During self test printing.
- (d) When the printer is in the OFF-LINE state. (At this time, the ON-LINE lamp is not lit: 1) If the printer cover is open; 2) paper supply is depleted or P.EMPTY lamp is lit; 3) an error is detected or the POWER Lamp is blinking; 4) the ON-LINE switch is pressed.)

An ACK signal is output if the BUSY signal goes LOW only when BUSY is generated due to conditions 1), 2) or 3).

*** ACK**

This signal that is synchronized with the falling edge of the BUSY signal is output after the initialization operations at power-on or after data is input.

*** P.EMP**

This signal goes HIGH when the printer is out of paper.

*** $\overline{\text{ERROR}}$**

This signal shows that the printer is in the error state and occurs in the following circumstances:

- (a) If the circuit component's temperature increases to an abnormal level.
- (b) If the right overrun switch is activated.
- (c) If current flows through a pin of the printhead when printing is not required.
- (d) If the home sensor is not operating properly, during initialization operations.
- (e) If the RAM error is detected, while performing initialization operations.

The sequence of events when an error occurs are as follows:

- (a) POWER lamp blinks
- (b) $\overline{\text{ERROR}}$ signal goes LOW
- (c) BUSY signal goes HIGH
- (d) Buzzer is sounded
- (e) Power for motion is turned off to terminate operations.

To terminate the error condition:

- (a) Turn the power switch OFF and then ON again,
- (b) Input the INITIAL signal.
- (c) Press the RESET switch.

Electrical Conditions

1. Signal Levels

All signals are TTL level.

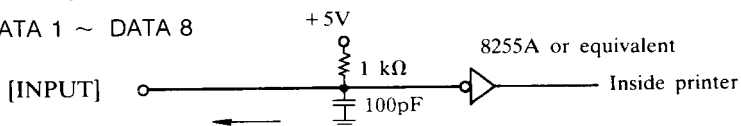
HIGH level +2.4~5.0V
 LOW level 0~0.4V

Measured at the input pins on the printer.

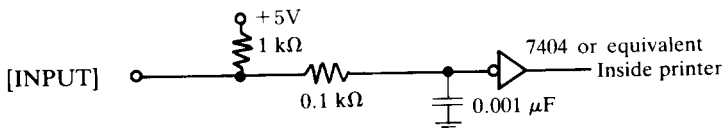
2. Input / Output Conditions

(a) Input Signals

DATA 1 ~ DATA 8

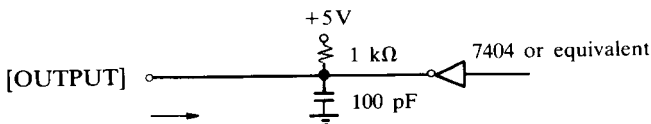


- $\overline{\text{INITIAL}}$ signal and $\overline{\text{STROBE}}$ signal



(b) Output Signals

- BUSY, $\overline{\text{ACK}}$, $\overline{\text{ERROR}}$, P.EMP signals.

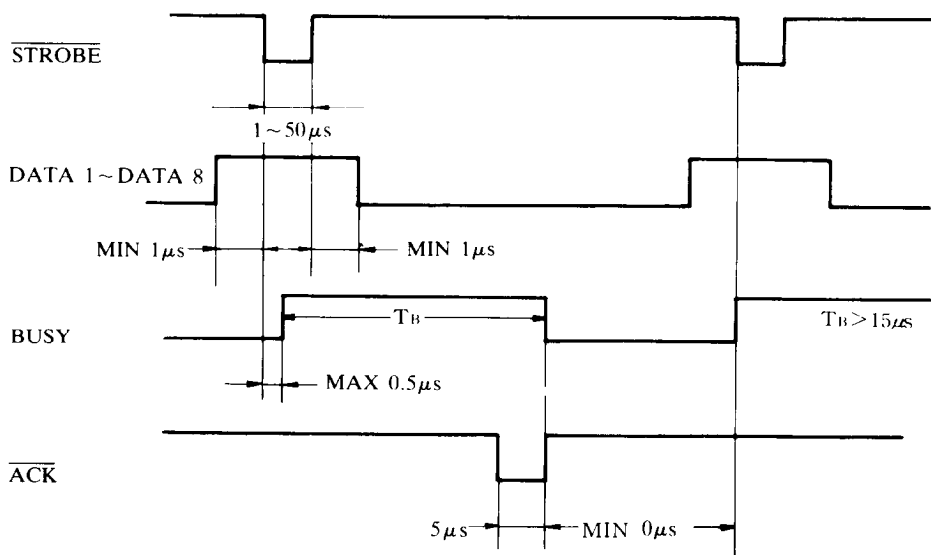


3. Signal Cable Length

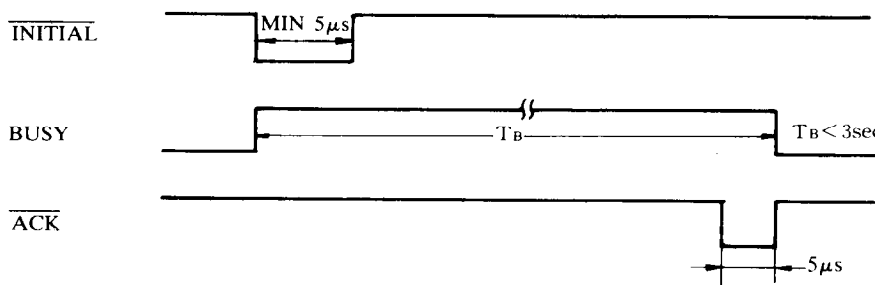
The maximum length is 2 meters. All the signal lines should be run as twisted pairs with the GND lines.

Timing Chart

(a) Data input



(b) Initialization



DIP Switch Setting

The parallel interface is selected when DIP switches 1-1 and 1-2 are set as follows:

DIP switch	SW1-1	SW1-2
Parallel	OFF	OFF

SERIAL INTERFACE

Input Connector

Cable side connector 25 pin (male)

Printer side connector 25 pin D-SUB type (female)

PIN	SIGNAL	IN/OUT	PIN	SIGNAL	IN/OUT
1	CHASSIS GND		14	NC	
2	TR	OUT	15	NC	
3	RD	IN	16	NC	
Note 2) 4	RTS	OUT	17	NC	
Note 2) 5	CTS (NC)	IN	18	NC	
Note 1) 6	DSR (NC)	IN	19	NC	
7	SIGNAL GND		20	DTR	OUT
Note 1) 8	CD (NC)	IN	21	NC	
9	NC		22	NC	
10	NC		23	NC	
11	SRTS	OUT	24	NC	
12	NC		25	NC	
13	NC				

Note 1: As shipped from the factory CTS, DSR, and DC are NC (NO CONNECTION).
If DSR or CD is to be used, perform the following to the jumpers J1, J2, J4 and J5 on the circuit board in the printer.

- If DSR is to be used, cut J2 and connect a jumper at J5.
- If CD is to be used, cut J1 and connect a jumper at J4.

Note 2: RTS and CTS are connected within the printer.

If CTS is to be used, cut J3 and connect a jumper at J6.

CAUTION: Changes in jumper connections should only be made by an authorized Epson Service representative.

Input/Output Signal Descriptions

1. Printer Input Signals

* RD (RECEIVED DATA)

This line is the data reception line for the serial signals from the computer. The data consists of a start bit, data (parity bit), and stop bit.

Data length 7/8 bits.

With/without parity bit.

Odd/even parity

} Selectable by DIP switches

* CTS (CLEAR TO SEND)

A data transmission control signal, NC (No Connection).

OFF: Data transmission may not be performed.

ON: Data transmission is possible.

* DSR (DATA SET READY)

A signal that displays the state of the modem, NC.

OFF: The modem cannot receive/transmit data.

ON: The modem can receive/transmit data.

CD (CARRIER DETECT)

A signal that indicates whether or not the carrier is detected, NC

OFF: No Carrier

ON: Carrier

2. Output Signals from the Printer

*TR (TRANSMIT DATA)

Employed for the X-ON/X-OFF and ETX/ACK control.

* RTS (REQUEST TO SEND)

On (SPACE) state is continuously output.

*SRTS

This is a handshaking signal representing the printer's BUSY state.

OFF: BUSY

ON: READY

* DTR (DATA TERMINAL READY)

This signal controls the state of the modem.

OFF: Modem transmitting/receiving cannot be performed.

ON: Modem transmitting/receiving can be performed.

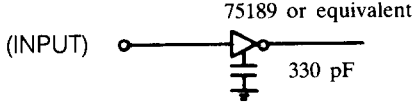
Electrial Conditions

1. Signal Level

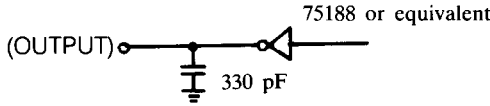
ON	Space	+3V ~ +15V
OFF	Mark	-3V~-15V

2. Input/Output Conditions

- Input signal



- Output signal



Handshake Protocol

Handshake protocol is selected by the DIP switch settings as show in in the table below

DIP switch Protocol	SW1-1	SW1-2
READY/BUSY	ON	ON
X-ON/X-OFF	ON	OFF
ETX/ACK	OFF	ON

1. READY/BUSY Protocol

The DTR line indicates the READY/BUSY state of the printer. It outputs an ON (+ 12V) in the READY state, and an OFF (-12V) in the BUSY state. When the remaining space of the 18K-byte communication buffer goes below 4K bytes, the DTR line turns OFF, terminating the transmission of data from the computer. Then when the buffer space increases to above the 10K-byte level, the DTR line turns ON, allowing data to be sent from the computer.

When the printer is in the paper empty state or the cover has been opened, the DTR line goes OFF. The SRTS line output is identical to the DTR output. The printer can receive up to 4K bytes more after the DTR line goes OFF.

2. X-ON /X-OFF Protocol

When the printer is receiving data, X-ON is output. When the printer is not able to receive data, X-OFF is output. When the computer receives the X-OFF signal, transmission of data to the printer is terminated. If the X-ON signal is then received, data is transmitted once again, When the communication buffer space goes below 4K bytes, X-OFF is sent. When the buffer space goes beyond 10K bytes, X-ON is sent.

X-ON is DC1 (11 HEX), and X-OFF is DC3 (13HEX). These signals are output through the TR line. The data format is the same as the input data structure.

3. ETXIACK Protocol

The printer sends an ACK (06HEX) to the computer in response to the data block separated by ETX (03HEX) which was sent by the computer. If the communication buffer space goes below 4K bytes, ACK is not sent. If the buffer space is more than 4K bytes, ACK is sent through the TR line. The ACK's output data format is the same structure as the input data.

Baud Rate

The following four baud rates are selected by DIP switches,

DIP switch Baud rate	SW1-4	SW1-5
1200 BPS	OFF	OFF
2400 BPS	ON	OFF
4800 BPS	OFF	ON
9600 BPS	ON	ON

Data Length 7/8 Bit Selection

A 7 bit or 8 bit data length may be selected by DIP switch 1-3. When the switch is ON, the 7 bit length is selected. When the switch is OFF, the 8 bit length is selected.

Stop Bit

One bit or more are required for the stop bits. However, when DIP switch 1-3 is ON and is set to 7 bits, and when there is no parity setting by SW 1-6 and SW 1-7, there is a need for 2 or more stop bits.

Parity

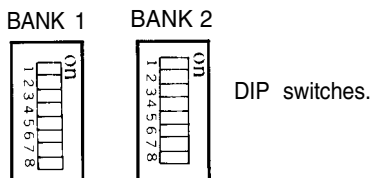
Whether a parity bit is to be used, and whether odd or even parity is to be used is selected by SW 1-6 and SW 1-7. If a parity error is generated during the input of data, whether the data is ignored or a "*" is to be printed, is selected by SW 1-8. If ON, the data is ignored. If OFF, the "*" mark is printed.

DIP switch Parity	SW1 -6	SW1-7
No parity	OFF	OFF
	ON	ON
Odd parity	OFF	ON
Even parity	ON	OFF

Note: All DIP switch selections should be performed with the power OFF.

DIP SWITCH SETTING

The Epson 420i has two banks of eight DIP switches located on the back of the printer next to the interface connectors. The switch banks are labeled 1 and 2, with the individual switches in each bank labeled from 1 to 8. To identify a particular switch we use a two part number consisting of the bank number followed by the switch number. For example, 2-4 identifies the fourth switch from the top in bank number 2.



All DIP switch selections should be performed with the power OFF. The switches are located at the rear of the printer next to the input connector. As shipped from the factory, all switches are turned OFF.

DIP Switch Bank 1

DIP Switch Bank 1 controls the selection of the interface that you want to use. If you are using a parallel interface, then you should be able to leave this bank of switches alone (they should be all set to OFF). If you are using the serial (RS-232-C) interface, then the settings of this bank of switches must be set to match the serial interface settings of your computer.

• Interface and Protocol Selection

Protocol	SW1-1	SW1-2
Parallel	OFF	OFF
X-ON/X-OFF	ON	OFF
ETX/ACK	OFF	ON
BUSY/READY	ON	ON

* Number of Data Bits Selection

Data Bits	SW1-3
8 bits	OFF
7 bits	ON

* Baud Rate Selection

Baud rate	SW1-4	SW1-5
1200 BPS	OFF	OFF
2400 BPS	ON	OFF
4800 BPS	OFF	ON
9600 BPS	ON	ON

* Parity Selection

Parity	SW1-6	SW1-7
No parity	OFF	OFF
	ON	ON
Odd parity	OFF	ON
Even Parity	ON	OFF

* Parity Error Selection

At time of parity error	SW1-8
Print" * "	OFF
Ignore data	ON

DIP Switch Bank 2

This bank of switches selects some of the other features of the Epson 420i. These switches may be left in the OFF position as they come from the factory, or you may wish to change some of the switch settings to select different features. First you must decide if you want to use the Epson FX mode or the IBM Graphics Printer mode, determined by Switch 2-4.

* LF (Line Feed) Command Selection

	Auto-LF	SW 2-1
Execute a line feed upon receiving a carriage return	Disabled Enabled	OFF ON

A carriage return is executed when the printhead returns to the print start or left margin position.

* CR (Carriage Return) Command Selection

	Auto-CR	SW 2-2
Execute a carriage return upon receiving a line feed	Disabled Enabled	OFF ON

If SW2-1 and SW2-2 are both set on ON, the CR command and the LF command perform the same function.

* Skip-over Perforation Selection

	Skip Perforation	SW 2-3
Skip-over perforation	Disabled	OFF
	Enabled	ON

* Operating Mode Selection

	Printer Mode	SW 2-4
Select operating mode	Epson Printer	OFF
	IBM Graphics Printer	ON

Note: Switch 2-4 changes several functions of the printer. See the differences between the Epson Printer mode and the IBM Graphics Printer mode (page 36 .)

* International Character Set Selection

	Character Set	SW2-5	SW2-6	SW2-7
Character set selection with SW2-4 OFF (Epson mode)	USA	OFF	OFF	OFF
	France	OFF	OFF	ON
	Germany	OFF	ON	OFF
	England	OFF	ON	ON
	Denmark	ON	OFF	OFF
	Sweden	ON	OFF	ON
	Italy	ON	ON	OFF
	Spain	ON	ON	ON

	Character Set	SW2-7
Character set selection with SW2-4 ON (IBM mode)	IBM set 1	OFF
	IBM set 2	ON

Note: Switch 2-8 is not used.

The international character set selection does not become valid until the printer is turned ON once again. The table below shows the international characters:

International Characters

	35	36	64	91	92	93	94	96	123	124	125	126
USA	#	\$	@	[	\	\]	^	~	{	|	}	~
France	#	\$	à	•	ç	ë	^	~	é	ù	è	“
Germany	#	\$	ß	ä	ö	ü	^	~	ä	ö	ü	ß
England	£	\$	@	[	\	\]	^	~	{	|	}	~
Denmark	#	\$	@	Æ	Ø	Å	^	~	æ	ø	å	~
Sweden	#	Ö	£	Ä	Ö	Å	Ü	é	ä	ö	å	ü
Italy	#	\$	@	•	\	é	^	~	à	ò	è	ì
Spain	Ñ	\$	@	;	Ñ	¿	^	~	“	ñ	}	~

CODE TABLE

The control code tables for the Epson and IBM (character set 1 and 2) modes are shown below.

CODE TABLE (EPSON MODE)

Upper Bit	Lower Bit	Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex	Binary	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL	SP	0	Ⓢ	P	Ⓢ	p					à	Á	ò	ÿ		
1	0001		DC1	!	1	A	Q	a	q				ä	Å	í	ç		
2	0010		DC2	"	2	B	R	b	r			DC2	å	ö	!'	ó		
3	0011	ETX	DC3	#	3	C	S	c	s				ä	ó	í	˘		
4	0100		DC4	\$	4	D	T	d	t			DC4	É	Ü	N	˘		
5	0101			%	5	E	U	e	u				F	ü	ñ	SP		
6	0110	ACK		&	6	F	V	f	v				é	ù	pt	SP		
7	0111	BEL			7	G	W	g	w	BEL			è	û	Æ	SP		
8	1000	BS	CAN	(	8	H	X	h	x	BS	CAN		é	ÿ	æ	SP		
9	1001	HT		)	9	I	Y	i	y	HT		#	£	Ø	SP			
A	1010	LF				J	Z	j	z	LF		@		ø	SP			
B	1011	VT	ESC	+		K		k		VT	ESC	β	§		{			
C	1100	FF		<		L		l		FF		-	†	\	ı			
D	1101	CR		=		M		m		CR		ˆ	ˆ	ı	}			
E	1110	SO		>		N		n		SO		ˆ	ˆ	ı	~			
F	1111	SI		/	?	O		o		DEL	SI	\$	→	SP	SP			DEL

Note: Encircled characters are selected by the DIP switches.

CODE TABLE (IBM CHARACTER SET 1)

Upper Bit																	
Lower Bit	Hex.	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex.	Binary	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111
0	0000	NUL	SP	0	@	P	\	p				␣	⌘	␣	α	≡	
1	0001	DC1	"	1	A	Q	a	q				␣	⌘	␣	α	±	
2	0010	DC2	"	2	B	R	b	r		DC2		␣	⌘	␣	α	±	
3	0011	ETX	#	3	C	S	c	s				␣	⌘	␣	α	±	
4	0100	DC4	\$	4	D	T	d	t		DC4		␣	⌘	␣	α	±	
5	0101		%	5	E	U	e	u				␣	⌘	␣	α	±	
6	0110	ACK	&	6	F	V	f	v				␣	⌘	␣	α	±	
7	0111	BEL	'	7	G	W	g	w	BEL			␣	⌘	␣	α	±	
8	1000	BS	CAN	(	B	H	x	h	x	BS	CAN	␣	⌘	␣	α	±	
9	1001	HT	)	9	I	Y	i	y	HT			␣	⌘	␣	α	±	
A	1010	LF	*	:	J	Z	j	z	LF			␣	⌘	␣	α	±	
B	1011	VT	ESC	+	:	K	{	k	{	VT	ESC	␣	⌘	␣	α	±	
C	1100	FF	,	<	L	\	l	l	FF			␣	⌘	␣	α	±	
D	1101	CR	-	-	M	]	m	]	CR			␣	⌘	␣	α	±	
E	1110	SO	>	>	N	^	n	n	SO			␣	⌘	␣	α	±	
F	1111	SI	/	?	O	~	o	o	DEL	SI		␣	⌘	␣	α	±	

Note: Encircled characters are selected by the DIP switches.

CODE TABLE (IBM CHARACTER SET 2)

Upper Bit	Lower Bit	Hex	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Hex	Binary	0000	0001	0010	0011	0100	0101	0110	0111	1000	1001	1010	1011	1100	1101	1110	1111	
0	0000	NUL	SP	0	@	P	\	p	C	E	A	⋮	U	α	≡	24		
1	0001	⊙	DC1	1	A	Q	a	q	U	æ	ſ	≡	⊥	⊥	β	±	24	
2	0010	⊙	DC2	2	B	R	b	r	E	ƒ	6	≡	≡	≡	≡	≡	≡	24
3	0011	♥	DC3	3	C	S	c	s	A	U	G	I	≡	≡	≡	≡	≡	24
4	0100	♦	DC4	4	D	T	d	t	K	Ø	≡	≡	≡	≡	≡	≡	≡	24
5	0101	♣	⊙	5	E	U	e	u	a	o	≡	≡	≡	≡	≡	≡	≡	24
6	0110	♠	⊙	6	F	V	f	v	A	U	a	≡	≡	≡	≡	≡	≡	24
7	0111	BEL	⊙	7	G	W	g	w	C	U	O	≡	≡	≡	≡	≡	≡	24
8	1000	BS	CAN	8	H	X	h	x	E	y	z	≡	≡	≡	≡	≡	≡	24
9	1001	HT	⊙	9	I	Y	i	y	E	U	≡	≡	≡	≡	≡	≡	≡	24
A	1010	LF	⊙	10	J	Z	j	z	E	U	≡	≡	≡	≡	≡	≡	≡	25
B	1011	VT	ESC	11	K	[	k	[	Y	≡	≡	≡	≡	≡	≡	≡	≡	25
C	1100	FF	⊙	12	L	\	l	l	≡	≡	≡	≡	≡	≡	≡	≡	≡	25
D	1101	CR	⊙	13	M	]	m	]	≡	≡	≡	≡	≡	≡	≡	≡	≡	25
E	1110	SO	⊙	14	N	^	n	~	≡	≡	≡	≡	≡	≡	≡	≡	≡	25
F	1111	SI	⊙	15	O	_	o	◊	≡	≡	≡	≡	≡	≡	≡	≡	≡	25

Note: Encircled characters are selected by the DIP switches.

CONTROL CODE SUMMARY

CATEGORY	ITEM	SYMBOLS	HEX (DECIMAL) CODE	FUNCTION
PRINT COMMANDS	1	CR	0D (13)	Printing only or plus line-feed
	2	LF	0A (10)	Line-feed after printing
	3	FF	0C (12)	Form feed after printing
	4	VT	0B (11)	Go to next vertical tab after printing
	5	ESC,J,n	1B, 4A, n (27, 74, n)	n/180" line-feed after printing
CHARACTER DESIGNATIONS	6	ESC,P	1B, 50 (27, 80)	Pica (10 CPI)
	7	ESC, M	1B, 4D (27, 77)	Elite (12 CPI)
	8	SI	0F (15)	Standard condensed (16 CPI)
	9	ESC, SI	1B, 0F (27, 15)	Ditto
	10	ESC, p, n	1B, 70, n (27, 112, n)	Proportional
	11	DC2	12 (18)	Termination of condensed
	12	ESC, S, 0	1B, 53, 30 (27, 83, 48)	Superscript
	13	ESC, S, 1	1B, 53, 31 (27, 83, 49)	Subscript
	14	ESC, T	1B, 54 (27, 84)	Termination of superscript/subscript
	15	ESC, !, n	1B, 21, n (27, 33, n)	Multiple print styles
CHARACTER FORMAT DESIGNATIONS	16	ESC, E	1B, 45 (27, 69)	Bold
	17	ESC, F	1B, 46 (27, 70)	Termination of bold
	18	ESC, G	1B, 47 (27, 71)	Double-strike
	19	ESC, H	1B, 48 (27, 72)	Termination of double-strike
	20	ESC, X, n	1B, 58, n (27, 88, n)	High quality (correspondence)
	21	ESC, x, n	1B, 78, n (27, 120, n)	Correspondence quality on/off
	22	ESC, 4	1B, 34 (27, 52)	Italic
	23	ESC, 5	1B, 35 (27, 53)	Termination of correspondence
	24	ESC, 6	1B, 36 (27, 54)	Character set 2 on
	25	ESC, 7	1B, 37 (27, 55)	Character set 2 off
DOUBLE-WIDTH MODE	26	SO	0E (14)	Double-width mode valid for only the present line
	27	ESC, SO	1B, 0E (27, 14)	Ditto
	28	DC4	14 (20)	Termination of double-width mode
	29	ESC, W, n	1B, 57, n (27, 87, n)	Double-width mode valid until terminated
GRAPHIC MODE	30	ESC, K, n1, n2	1B, 4B, n1, n2 (27, 75, n1, n2)	Standard graphic mode
	31	ESC, L, n1, n2	1B, 4C, n1, n2 (27, 76, n1, n2)	Double-density graphic mode
	32	ESC, k, n1, n2	1B, 6B, n1, n2 (27, 107, n1, n2)	High density graphic mode
	33	ESC, *, m, n1, n2	1B, 2A, 6D, n1, n2 (27, 42, 109, n1, n2)	Selected density dot graphics
	34	ESC, Y, n1, n2	1B, 59, n1, n2 (27, 89, n1, n2)	High-speed double-density dot graphics
	35	ESC, Z, n1, n2	1B, 5A, n1, n2 (27, 90, n1, n2)	Quadruple-density dot graphics

CATEGORY	ITEM	SYMBOLS	HEX-(DECIMAL) CODE	FUNCTION
HORIZONTAL TAB	36	ESC, D, n1, n2, ...nk, NUL	1B, 44, n, n2, ...nk, 00 (27, 68, n1, n2, ...nk, 0)	Horizontal tab setting
	37	HT	09 (9)	Move to next tab position
	38	ESC, O, n	1B, 51, n (27, 81, n)	Right margin setting
	39	ESC, I, n	1B, 6C, n (27, 108, n)	Left margin setting
PAGE LENGTH SETTING	40	ESC, C, n	1B, 43, n (27, 67, n)	Line unit page length setting
	41	ESC, C, (00), n	1B, 43, 00, n (27, 67, 0, n)	Inch unit page length setting
VERTICAL TAB	42	ESC, B, n1, n2, ...nk, NUL	1B, 42, n1, n2, ...nk, 00 (27, 66, n1, n2, ...nk, 0)	Vertical tab setting
	43	ESC, b, m, n1, n2, ...nk, NUL	1B, 62, m, n1, n2, ...nk, 00 (27, 98, m, n1, n2, ...nk, 0)	Channel vertical tab setting
	44	ESC, I, m	1B, 2F, m (27, 47, m)	Channel selection of vertical tab setting
LINEFEED PITCH	45	ESC, 0	1B, 30 (27, 48)	Sets line-feed pitch to 1/8"
	46	ESC, 1	1B, 31 (27, 49)	Sets line-feed pitch to 7/60"
	47	ESC, 2	1B, 32 (27, 50)	Sets line-feed pitch to 1/6"
	48	ESC, 3, n	1B, 33, n (27, 51, n)	Set line-feed pitch to n/180"
	49	ESC, A, n	1B, 41, n (27, 65, n)	Sets line-feed pitch to n/60"
	50	ESC, ,, n	1B, 2E, n (27, 46, n)	Sets line-feed pitch to n/120"
UNDERLINE	51	ESC, -, n	1B, 2D, n (27, 45, n)	Underline setting and termination
BUFFER CLEAR	52	CAN	1B, (24)	Clearing of print data
BACK SPACE	53	BS	08 (08)	After printing, moves one character position to the left
AREA DESIGNATION	54	ESC, =	1B, 3D (27, 61)	MSB of data is "0"
	55	ESC, >	1B, 3E (27, 62)	MSB of data is "1"
	56	ESC, #	1B, 23 (27, 35)	8-bit valid
SKIP-OVER PERFORATION	57	ESC, N, n	1B, 4E, n (27, 78, n)	Skips n bottom lines of page
	58	ESC, O	1B, 4F (27, 79)	Termination of skip-over perforation
DATA DELETE	59	DEL	7F (127) or FF (255)	Deletes one character worth of data
HOME POSITIONING	60	ESC,	1B, 3C (27, 60)	Moves printhead to home position
COUNTRY CHARACTER	61	ESC, R, n	1B, 52, n (27, 82, n)	Selects among 8 countries
	62	BEL	07 (07)	Sounds buzzer for 0.3 seconds
RESET	63	ESC, @	1B, 40 (27, 64)	Initializes printer
PRINT DIRECTION	64	ESC, U, n	1B, 55, n (27, 85, n)	Unidirectional printing until terminated
PAPER-OUT SENSOR	65	ESC, 8	1B, 38 (27, 56)	Disable paper-out sensor
	66	ESC, 9	1B, 39 (27, 57)	Enable paper-out sensor

Relationship among the font, bold, double-strike and double-width functions is shown in the table below.

Font	Bold Mode	Double-strike Mode	Double-width Mode
Standard pica	0	0	0
Standard elite	0	0	0
Standard condensed	0	0	0
Italic pica	0	0	0
Italic elite	0	0	0
Italic condensed	0	0	0
High quality pica	0	x	0
High quality elite	0	x	0
High quality proportional	0	x	0
High quality italic pica	0	x	0
High quality italic elite	0	x	0
High quality italic proportional	0	x	0
Standard superscript/subscript	x	x	0
Italic superscript/subscript	x	x	0

0: Can be used simultaneously x: Cannot be used simultaneously

The bold and double-strike modes may not be entered simultaneously. The last mode input has priority.

In all print modes, the double-width mode may be used simultaneously with the bold or double-strike print modes.

Differences between the Epson Printer mode and the IBM Graphics Printer mode

Selecting one of the two mode (Epson Printer or IBM Graphics Printer mode) changes several things about the way the Epson 420i operates. The following functions change when you change the setting of Switch 2-4.

1. The character set changes. The IBM Graphics Printer mode supports the extended IBM Graphics Printer character set. There are two versions of this character set and you choose the one you want with Switch 2.7, or with software commands `ESC6` and `ESC7`. The IBM character set 2 includes more characters than the IBM set 1 but, otherwise the two sets are the same. The software commands `ESC6` and `ESC7` are ignored if you are using the Epson FX printer mode.

The Epson printer mode includes 8 international character sets. Within each set, 12 characters may be different from country to country. You can choose the set that you want with Switches 2-5, 2-6, and 2-7, or with a software command `ESC R`. The software command `ESC R` is ignored if you are using the IBM Graphics Printer mode.

2. Two of the commands to set line spacing `ESC A` and `ESC 2` work differently with each option.

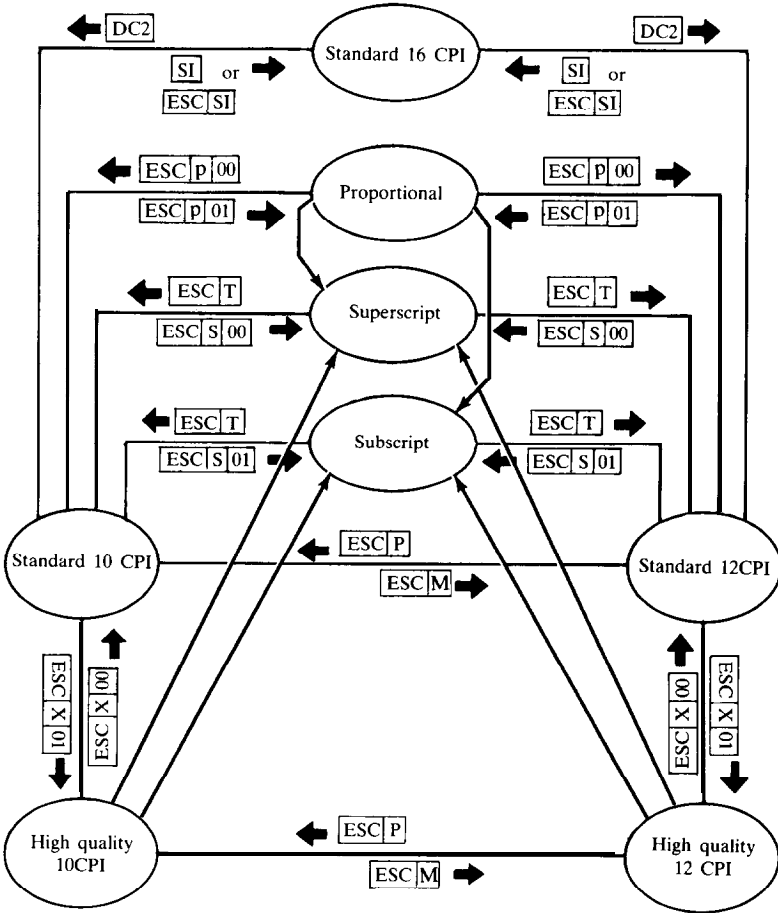
When you choose the Epson printer mode, the `ESC 2` command selects 1/6-inch line spacing, and the `ESC A n` command selects n/60-inch line spacing.

When you choose the IBM Graphics Printer mode, the `ESC 2` command sets the line spacing to that defined by the `ESC A n` command. If an `ESC A` command has not been used, then the `ESC 2` command sets the line spacing to 1/16-inch. The `ESC A n` command defines a line spacing of n/60, (but must be followed by an `ESC 2` command to actually use that spacing.)

3. When you are using the IBM Graphics Printer mode, the commands to control the state of the eighth-bit `ESC #`, `ESC =`, and `ESC >` are ignored.

PRINT MODE FLOWCHART

* 16 CPI refers to condensed printing



* 12 CPI refers to Elite printing

* 10 CPI refers to Pica printing

- Note: 1) Italic print mode is set by `ESC 4` and terminated by `ESC 5`
 2) This flow chart is valid only when the MODE dial switch is set to '0'. If any other is selected, the software designations of the above are ignored.

CONTROL CODE EXPLANATION

Print Commands

1. **CR** (0D)H (13)D, (8D)H (141)D

Input of this code initiates printing. DIP SW2-2 indicates whether or not a line-feed is to be performed after printing. When no print data is input, the printhead does not move. Print data input after this print command has been performed is printed at the beginning of the line.

If a line-feed is to be performed and if the **SO** command (double-width character mode) is set, that mode is deleted.

2. **LF** (0A)H (10)D, (8A)H (138)D

Input of this code results in printing and line-feed. The line-feed width is set by the line-feed amount command. If no print data has been input, only a line-feed is performed. By setting DIP SW2-1, it is possible to have the data print out start at the beginning of the next line.

This command terminates the double-width character mode set by the **SO** command.

3. **FF** (0C)H (12)D, (8C)H (140)D

Input of this code results in line-feeds after printing until the top of the next page is reached. The setting for one page is performed by the switch located at the front of the printer or by the software designation.

Print data following the **FF** command is printed at the beginning of the line.

The double-width character mode set by the **SO** command is terminated.

4. **VT** (0B)H (11)D, (8B)H (139)D

Input of this code results in a paperfeed until the next vertical tab. If a vertical tab is not set, this command performs the same operation as the **LF** code. If at least one vertical tab is set and there is no setting until the next page, a paper-feed is carried out until the top of the next page is reached.

If the **SO** (double-width character mode) is set, it is terminated.

Setting of a vertical tab is performed by the **ESC B** or **ESC b** command.

5. **ESC J n** (1 B, 4A, n)H (27, 74, n)D, (9B, CA, n)H (155, 202, n)D

$0 \leq n \leq 255$. n is a binary 8-bit code. Input of this code results in a $n/180$ inch paper-feed after printing. This line-feed value is not stored within the printer. This starting position of the next line is at the right side of the line printed previously.

When n is not 0, the **SO** mode is canceled if it is set.

Character Designation Commands

6. **ESC P** (1B, 50)H (27, 80)D, (9B, D0)H (155, 208)D

Input of this code selects the 10 CPI pica print mode.

7. **ESC M** (1B, 4D)H (27, 77)D, (9B, CD)H (155, 205)D

Input of this code selects the 12 CPI elite print mode.

8. **SI** (0F)H (15)D, (8F)H (143)D

Input of this code selects the 16 CPI standard condensed print mode

9. **ESC SI** (1B, 0F)H (27, 15)D, (9B, 8F)H (155, 143)D

Same as **SI**

10. **ESC p n** (1B, 70, n)H (27, 112, n)D, (9B, F0, n)H (155, 240, n)D

This code selects and cancels the proportional print mode.

n = (01)H or (31)H Selects proportional print mode.

n = (00)H or (30)H Cancels proportional print mode.

When the proportional print mode is set, the **BS** code and **DEL** code are ignored.

11. **DC2** (12)H (18)D, (92)H (146)D

This code terminates the condensed print mode.

12. **ESC S (00) or (30)** (1B, 53,00)H (27,83,0)D, (9B,D3,00)H (155,211,0)D

This code selects the superscript print mode.

13. **ESC S (01) or (31)** (1B, 53,01)H (27, 83, 1)D, (9B,D3,01)H (155,211,1)D

This code selects the subscript print mode.

14. **ESC T** (1B, 54)H (27, 84)D, (9B, D4)H (155, 212)D

This code terminates superscript / subscript print modes.

15. **ESC ! n** (1B, 21, n)H (27, 33, n)F

This code allows you to select multiple print styles (i.e., pica-italic-underlined) with one command. The value of *n* determines the style selected. To determine a value of *n*, add the values given for the print styles that you want to use from the table below. (Note that some styles can't be combined.)

Style	Value
Pica	0
Elite	1
Proportional	2
Compressed	4
Emphasized	8
Double-Strike	16
Enlarged	32
Italic	64
Underlined	128

For example, if you want to select elite double-strike Italic print, you would calculate the value of *n* like this:

Elite	1
Double-strike	16
Italic	64
<i>n</i> =	<hr/> 81

Character Format Commands

16. **ESC E** (1B, 45)H (27, 69)D, (9B, C5)H (155, 197)D

This code selects the bold print mode.

This code is invalid in the superscript / subscript print mode. The double-strike mode is cleared when this code is selected.

17. **ESC F** (1B, 46)H (27, 70)D, (9B, C6)H (155, 198)D

This code terminates the bold print mode.

18. **ESC G** (1B, 47)H (27, 71)D, (9B, C7)H (155, 199)D

This code selects the double-strike mode. This code is only valid in pica, elite and condensed printing of standard and Italic characters. It is invalid in high quality and superscript / subscript modes. Bold print mode is canceled if it is set.

19. **ESC H** (1B, 48)H (27, 72)D, (9B, C8)H (155, 200)D

This code terminates double-strike mode.

20. **ESC X n** (1B, 58, n)H (27, 88, n)D, (98, D8, n)H (155, 216, n)D

This code selects high quality (correspondence) print mode.

n = (01)H or (31)H Selects high quality print mode.

n = (00)H or (30)H Terminates high quality print mode

This code is valid only in standard pica and standard elite print modes.

21. **ESC x n** (1B, 78, n)H (27,120,n)D

This code selects correspondence quality print (n = 1) or draft print (n = 0).

22. **ESC 4** (1B, 34)H (27, 52)D, (9B, B4)H (155, 180)D

This code selects italic print mode.

23. **ESC 5** (1B, 35)H (27, 53)D, (9B, B5)H (155, 181)D

This code terminates italic print mode.

24. **ESC 6** (1B,36)H (27,54)D (IBM mode only)

In the IBM Graphics Printer mode, this command selects the IBM Graphics Printer character set 2 which includes characters not contained in character set 1.

25. **ESC 7** (1B,37)H (27,55)D (IBM mode only)

In the IBM Graphics Printer mode, this command selects the IBM Graphics Printer character set 1.

Double-Width Character Printing Commands

26. **SO** (0E)H (14)D, (8E)H (142)D

This code selects double-width print mode. This command is only valid for a single line of printing. If more than a single line worth of print data is input, the automatic printing function prints the data. However, after the line-feed is performed, the double-width print mode is terminated.

This command is terminated by a linefeed, **DC4** or **ESC W n** code

27. **ESC SO** (1B, 0E)H (27, 14)D, (9B, 8E)H (155, 142)D

Same as the **SO** code.

28. DC4 (14)H (20)D, (94)H (148)D

This code terminates the double-width print mode SO code.

29. ESC W n (1B, 57, n)H (27, 87, n)D, (9B, D7, n)H (155, 215, n)D

This code is a double-width print mode code that is not terminated by the line-feed. This code clears them mode.

- n = (01) or (31) Selects double-width print mode.
- n = (00) or (30) Terminates double-width print mode.

Graphic Printing Commands

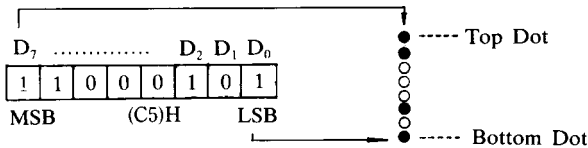
Do not select 7-bit mode in graphic printing.

30. ESC K n1 n2 (1B, 4B, n1, n2)H (27, 75, n1, n2)D, (9B, CB, n1, n2)H (155, 203, n1, n2)D

This code is a standard graphic select command. There are a maximum of 816 horizontal dots. The n1 and n2 are binary numbers that indicate the number of bytes of graphic data. The number is $n2 \times 256 + n1$. The n1 is the low byte and the n2 is the high byte. After this code has been performed all settings remain unchanged.

The amount of printable data per line is 816 dots maximum. If a printing designation input exceeds this amount, the remainder is ignored. The automatic printing function does not operate in this case.

The relationship between graphic data and printed dots is shown below.



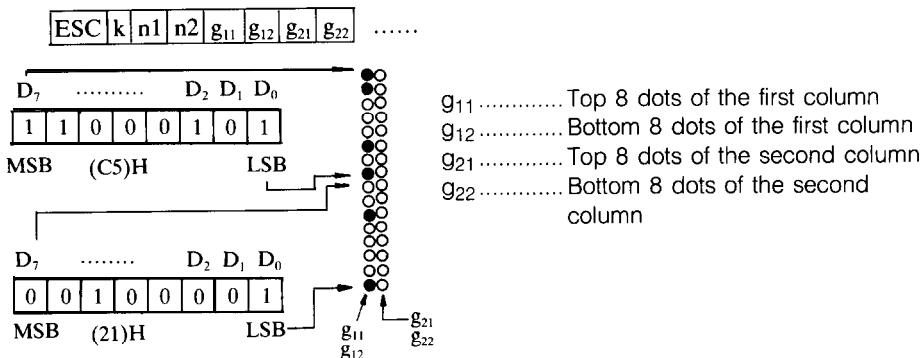
31. ESC L n1 n2 (1B, 4C, n1, n2)H (27, 76, n1, n2)D, (9B, CC, n1, n2)H (155, 204, n1, n2)D

This code selects double-density graphic mode. The maximum number of horizontal dots is 1632. The n1 and n2 are binary numbers that indicate the number of bytes of graphic data. The n1 is a low byte and n2 is a high byte. The others are the same as the ESC K code.

32. ESC k n1 n2 1B, 6B, n1, n2)H (27,107, n1, n2)D, (9B, EB, n1, n2)H (155, 235, n1, n2)D

This code selects high density graphic mode. The maximum number of vertical dots is 16 and the maximum of horizontal dots is 1632. The n1 and n2 are binary numbers that display the graphic data number. Note that 16 vertical dots require 2 bytes of data, but they are considered as a single data block.

The relationship between graphic data and the printed dots is shown below



33. ESC * m n1 n2 (1B, 2A, 6D, n1, n2)H (27, 42, 109, n1, n2)D

This command prints dot graphics in a density determined by the value of m (see table below). The values of n1 and n2 are determined as in the other graphics commands (i.e. n1 + n2* 256 = the number of dot columns). This command must be followed by the correct number of graphic data (1 byte per column for m = 0 to 6, 2 bytes per column for m = 7).

Value of m	Function of Command
0	Same as ESC k
1	Same as ESC L
2	Same as ESC Y
3	Same as ESC Z
4	Same as ESC K
5	Same as ESC K
6	Same as ESC K
7	Same as ESC k

34. ESC Y n1 n2 (1B, 59, n1, n2)H (27, 89, n1, n2)D

This code prints high-speed, double-density dot graphics at 120 dots per inch. The values of n1 and n2 define the number of bytes of data according to the formula n1 + n2*256. Each byte of data controls the printhead pins in one vertical row of dots. The maximum number of bytes of data is 1632.

35. **ESC Z n1 n2**(1B, 5A, n1, n2)H (27, 90, n1, n2)D

This code prints quadruple-density dot graphics at 240 dots per inch. The values of n1 and n2 define the number of bytes of data according to the formula $n1 + n2 \cdot 256$. Each byte of data controls the printhead pins in one vertical row of dots. The maximum number of bytes of data is 3264.

Horizontal Tab Commands

36. **ESC D n1 n2 ... nk NUL**(1B, 44, n1, n2, nk, 00)H (27, 68, n1, n2, ... nk, 0)D, (9B, C4, n1, n2, nk, 00)H, (155, 196, n1, n2, nk, 0)D

This code sets the horizontal tab. The maximum number of horizontal tab settings is 28. At power-on, the horizontal tabs are automatically set for every 8th column. When this code is input, these tabs are cleared.

The n is a binary number that designates the column number. The horizontal tabs are set in present character width. The horizontal tabs are set in sequence with the smallest first. The command ends with a **NUL** code. However, if the sequence is made in the reverse order, the setting is terminated at that point. When the horizontal tabs are set in pica print mode, elite print mode, or condensed print mode, and the mode is changed, the position of the tabs on the paper remains the same.

When the left or the right margin is set, the tab position already set is cleared. The left margin position is considered to be the home position, and horizontal tabs are automatically placed every 8th column in the same manner as they were at power-on.

$$1 \leq k \leq 28$$

n ranges

	Pica	Elite	Condensed
Standard character	$1 \leq n \leq 135$	$1 \leq n \leq 162$	$1 \leq n \leq 216$
Double-width character	$1 \leq n \leq 67$	$1 \leq n \leq 80$	$1 \leq n \leq 107$

37. **HT** (09)H (9)D, (89)H (137)D

This code causes a move to the next horizontal tab position.

36. **ESC Q n**(1B, 51, n)H (27, 81, n)D, (9B, D1, n)H (155, 209, n)D

This code sets the right margin. The n selects the column with the present character width as the base. This code is ignored if the value of n exceeds a single line. This code is also ignored if the width between the left and right margins is less than 2 pica double-width print mode characters. This command deletes the print data and horizontal tabs.

39. **ESC ℓ n** (1B, 6C, n)H (27,108, n)D, (9B, EC, n)H (155, 236, n)D

This code sets the left margin, The n selects the column with the present character width as the base. This code is ignored if the value of n exceeds a single line. This code clears the print data input already and the horizontal tabs..

If the left and right margins overlap, the one input first is considered valid

Page Length Setting Commands

The length of the page at power-on is selected by the FORM switch.

The following two codes, 40 and 41, are valid only when the FORM switch is set to "0",

40. **ESC C n**(1B, 43, n)H (27, 67, n)D, (9B, C3, n)H (155, 195, n)D

1 $n \leq 127$. If $n \leq 128$, this is ignored.

This code selects the page length in line units. The n is the line number. The length of a page is set by multiplying n by the present line-feed setting for a line. The maximum length of a page allowed to be set is 91 inches.

The paper position at the time this command is performed becomes the head of the first page. The page length will not change even if a line-feed amount is altered.

41. **ESC C (00) n**(1B, 43, 00, n)H (27, 67, 0, n)D, (9B, C3, 00, n)H (155, 195, 0, n)D

1 $\leq n \leq 22$. When $n \geq 23$ or $n = 0$, this is ignored. This code sets the page length in inches. The n is the number of inches,

Vertical Tab Commands

42. **ESC B n1 n2 nk NUL** (1B, 42, n1, n2, nk, 00)H (27, 66, n1, n2, nk, 0)D, (9B, C2, n1, n2, nk, 00)H (155, 194, n1, n2, nk, 00)D

This code sets the vertical tab positions. The n selects the number of lines. The vertical tab is positioned by multiplying the present single line-feed setting for a line by the set number of lines, The vertical tabs are set in sequence, with the smallest set first. The code sequence ends with the **NUL** code.

A vertical tab is also automatically set at the head of the page

43. **ESC b m n1 n2 nk NUL** (1B, 62, m, n1, n2, nk, 00)H (27, 98, m, n1, n2, nk, 0)D, (9B, E2, m, n1, n2, nk, 00)H (155, 226, m, n1, n2, nk, 0)D

0 $\leq m \leq 7$. This code sequence set the vertical tabs per channel. The m specifies the channel. When $m = 0$, this code becomes the same as the **ESC B** code. The method of setting is the same as is done with **ESC B** .

44. **ESC / m** (1B, 2F, m)H (27, 47, m)D, (9B, AF, m)H (155, 175, m)D

$0 \leq m \leq 7$. This code selects the vertical tab channel. When $m = 0$, the vertical tabs set by **ESC B** are used. **hVT** code is used to move to the vertical tab positions.

Line-Feed Value Setting Commands

45. **ESC 0** (1B, 30)H (27, 48)D, (9B, B0)H (155, 176)D

This code sets the line-feed pitch to 1/8 inch.

46. **ESC 1** (1B, 31)H (27, 49)D, (9B, B1)H (155, 177)D

This code sets the line-feed pitch to 7/60 inch.

47. **ESC 2** (1B, 33)H (27, 50)D

In the IBM Graphics Printer mode, this command sets the line spacing to the spacing selected with the **ESC A** command. If the **ESC A** command has not been used, this command sets the line spacing to 1/6 inch.

48. **ESC 3 n** (1B, 33, n)H (27, 51, n)D, (9B, B3, n)H (155, 179, n)D

This code sets the line-feed pitch to $n/180$ inch.

49. **ESC A n** (1B, 41, n)H (27, 46, n)D

In the IBM Graphics Printer mode, this command only defines a line spacing of $n/60$ inch. This command must be followed by the **ESC 2** command to actually set the selected line spacing.

In the Epson Printer mode, this command sets the line spacing to $n/60$ inch.

50. **ESC . n** (1B, 2E)H (27, 46, n)D

This code sets the line spacing for subsequent line feed commands to $n/120$ inch.

Underline Commands

51. **ESC - n** (1B, 2D, n)H (27, 45, n)D, (9B, AD, n)H (155, 173, n)D

This code performs the setting and termination of underlining.

$n = (01)H$ or $(31)H$ Sets underline.

$n = (00)H$ or $(30)H$ Termination of underline.

An underline is not output when the printing position is moved due to a tab. The underline is printed in 9th vertical dot position.

Buffer Clear Command

52. **CAN** (18)H (24)D, (98)H (152)D

This code deletes the print data that has already been input. However, the control codes are still valid.

Back Space Commands

53. **BS** (08)H (08)D, (88)H (136)D

This code prints the contents of the buffer. The printing initiation position is moved to the left by a single character width, determined by the present character width setting. This code is ignored in proportional print mode.

54. **ESC =** (1B, 3D)H (27, 61)D (Epson mode only)

In the Epson Printer mode, this code sets the eighth data bit to 0.

55. **ESC >** (1B, 3E)H (27, 62)D (Epson mode only)

In the Epson Printer mode, this code sets the eighth data bit to 1.

56. **ESC #** (1B, 23)H (27, 35)D (Epson mode only)

In the Epson Printer mode, this command cancels control of the eighth data bit set by either the set eighth-bit or clear eighth-bit command.

Skip-Over Perforation Commands

57. **ESC N n** (1B, 4E, n)H (27, 78, n)D, (9B, CE, n)H (155, 206, n)D

This code sets skip-over perforation line-feed mode. The n is set in line units. A form feed to the top of the next page is automatically performed when the remaining lines on the present page is less than n.

Setting DIP SW2-3 allows the selection of a 1 -inch skip-over perforation mode. This command has priority over the DIP switch setting.

58. **ESC O** (1B, 4F)H (27, 79)D, (9B, CF)H (155, 207)D

This code terminates the skip-over perforation mode.

Data Delete Command

59. **DEL** (7F)H (127)D, (FF)H (255)D

This code deletes one character worth of data. This code is ignored during the proportional print mode.

Home Position Command

60. **ESC**< (1B, 3C)H (27, 60)D, (9B, BC)H (155, 188)D

This code moves the print head to the home position.

International Character Set Command

61. **ESC R n** (1B, 52, n)H (27, 82, n)D (Epson mode only)

In the Epson Printer mode, this command selects from one of the 8 international character sets as shown in the table below.

n	Country
0	U.S.A.
1	France
2	Germany
3	U.K.
4	Denmark
5	Sweden
6	Italy
7	Spain

n is binary number.

Buzzer Command

62. **BEL** (07)H (07)D, (87)H (135)D

This code causes the buzzer to sound for approximately 1/3 second.

Reset Command

63. **ESC @** (1B, 40)H (27, 64)D (9B, C0)H (155, 192)D

This code initializes the printer. Data input after this code is not deleted

Print Direction Command

64. **ESC U n**(1B, 55, n)H (27, 85, n)D, (9B, D5, n)H (155, 213, n)D

This code selects unidirectional printing from the left to the right. Graphic mode is also printed unidirectionally.

- | | |
|--------------------|--|
| n = (01)H or (31)H | Selects unidirectional printing |
| n = (00)H or (30)H | Selects bidirectional logic seeking printing |

When power is turned on, or when the RESET switch is pressed, the bidirectional printing is selected. This function can also be selected by operating switches. If the FF switch is pressed in the ON-LINE state, the unidirectional printing is selected after buzzing for 0.1 second. If the LF switch is pressed in the ON-LINE state, the bidirectional printing is selected after 0.1 second of sounding the buzzer.

Paper-Out Sensor On/Off Commands

65. **ESC 8**(1B, 38)H (27, 56)D

This code turns the paper-out sensor off and allows you to print to the bottom of single sheets of paper.

66. **ESC 9**(1B, 39)H (17, 57)D

This code turns the paper-out sensor on so that it will report when the printer runs out of paper. This is the default condition.

PROGRAM EXAMPLES

1. **CR** Carriage return

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=1 TO 3
20 PRINT #1,"EPSON "+CHR$(13) 'CR CODE 13
30 PRINT #1,"      420i"+CHR$(141)'CR CODE 141
40 NEXT I
50 END
```

EPSON 420i

2. **LF** Line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=1 TO 3
20 PRINT #1,"EPSON"+CHR$(10);'LF CODE 10
30 PRINT #1,"      420i"+CHR$(138);'LF CODE 138
40 NEXT I
50 END
```

EPSON

420i

EPSON

420i

EPSON

420i

3. **FF** Form feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)+"C"+CHR$(0)+CHR$(2)'SET PAGE LENGTH TO 2 INCHES
20 PRINT #1,"TOP OF PAGE 1 "+CHR$(10)
30 PRINT #1,"LET'S PRINT WHATEVER YOU WANT"+CHR$(10)
40 PRINT #1,CHR$(12)'FF CODE
50 PRINT #1,"TOP OF PAGE 2"
60 PRINT #1,CHR$(12)'FF CODE
70 PRINT #1,"TOP OF PAGE 3"+CHR$(10)
80 END
```

TOP OF PAGE 1
LET'S PRINT WHATEVER YOU WANT

TOP OF PAGE 2

TOP OF PAGE 3

4. VT**Vertical tab**

```
1 OPEN "LFT1;" AS #1
2 WIDTH #1,255
5 PRINT #1,CHR$(27)"C"CHR$(0)CHR$(3);'PAGE LENGTH IS 3 INCHES
10 PRINT #1,CHR$(27)+"B"+CHR$(1)+CHR$(10)+CHR$(12)+CHR$(0);
20 'VERTICAL TABS SETTING AT 2ND,11TH AND 13TH LINE,
25 FOR I=1 TO 2
30 PRINT #1,"FIRST LINE"+CHR$(11);'VT CODE IS 11
40 PRINT #1,"SECOND LINE"+CHR$(11);'VT CODE 11
50 PRINT #1,"11TH LINE"+CHR$(11);'VT CODE 11
60 PRINT #1,"12TH LINE"+CHR$(139);'TOP OF NEXT PAGE
65 NEXT I
70 END
```

FIRST LINE
SECOND LINE

11TH LINE

12TH LINE

FIRST LINE
SECOND LINE

11TH LINE

12TH LINE

5. **ESC J n** n/180 inches line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=20 TO 180 STEP 20
20 PRINT #1,"EPSON "I
30 PRINT #1,CHR$(27)"J"CHR$(I)
40 NEXT I
50 END
```

EPSON 20

EPSON 40

EPSON 60

EPSON 80

EPSON 100

EPSON 120

EPSON 140

EPSON 160

EPSON 180

6. **ESC P** Pica

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"P" 'SPECIFIES PICA
20 FOR I=32 TO 127
30 PRINT #1,CHR$(I);
40 NEXT I
50 PRINT #1,CHR$(10)
60 END
```

!"*%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz

7. **ESC M** Elite

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"M" 'SPECIFIES ELITE
20 FOR I=32 TO 127
30 PRINT #1,CHR$(I);
40 NEXT I
50 PRINT #1,CHR$(10)
60 END
```

!"##%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMN0PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz

8. **SI** Condensed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(15); 'SPECIFIES CONDENSED
20 FOR I=32 TO 127
30 PRINT #1,CHR$(I);
40 NEXT I
50 PRINT #1,CHR$(10)
60 PRINT #1,CHR$(18)'CANCELS CONDENSED
70 END
```

!"##%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMN0PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz

9. **ESC SI** Condensed

Refer to 8.

10. **ESC p** Proportional

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"p1"; 'SETTING PROPORTIONAL
20 FOR M=1 TO 2
30 FOR I=32 TO 127
40 PRINT #1,CHR$(I);
50 NEXT I
60 PRINT #1,CHR$(10)
70 PRINT #1,CHR$(27)"p0"; 'CLEARS PROPORTIONAL
80 NEXT M
90 END
```

!"##%&'OX+,-./0123456789;<=>?@ABCDEFGHIJKLMN0PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz(i)
!"##%&'()*+,-./0123456789;<=>?@ABCDEFGHIJKLMN0PQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz

11. **DC2** Termination of condensed

Refer to 8.

12. **ESC S 0** Superscript

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,"X";
20 PRINT #1,CHR$(27)"S0";'SPECIFYING SUPERSCRIPT
30 PRINT #1,"2";
40 PRINT #1,CHR$(27)"T";'CLEARS SUPERSCRIPT
50 PRINT #1,"+X=Y"
60 END
```

$X^2+X=Y$

13. **ESC S 1** Subscript

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"X1";'HIGH QUALITY
20 PRINT #1,"H";
30 PRINT #1,CHR$(27)"X0";'CANCELS HIGH QUALITY
40 PRINT #1,CHR$(27)"S1";'SUBSCRIPT
50 PRINT #1,"2";
60 PRINT #1,CHR$(27)"T";'CANCELS SUBSCRIPT
70 PRINT #1,CHR$(27)"X1";'HIGH QUALITY
80 PRINT #1,"S0";
90 PRINT #1,CHR$(27)"X0";'CANCELS HIGH QUALITY
100 PRINT #1,CHR$(27)"S1";'SUBSCRIPT
105 PRINT #1,"4";
110 PRINT #1,CHR$(27)"T";'CANCELS SUBSCRIPT
120 END
```

H_2SO_4

14. **ESC T** Termination of superscript/subscript

Refer to 13.

15. **ESC ! n** Elite, double-strike, italic

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"!"CHR$(81) 'ELITE, DOUBLE
    STRIKE, ITALIC
20 PRINT #1,"ELITE, DOUBLE STRIKE, ITALIC"
30 PRINT #1,CHR$(27)"@"
40 END
```

ELITE, DOUBLE STRIKE, ITALIC

16. **ESC E** Bold

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"E"; 'BOLD
20 PRINT #1,"ABCDE ";
30 PRINT #1,CHR$(27)"F"; 'CANCELS BOLD
40 PRINT #1,"SPLENDID HENRY"CHR$(10);
50 END
```

ABCDE SPLENDID HENRY

17. **ESC F** Termination of bold

Refer to 16.

18. **ESC G** Double-strike

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"F";'PICA
20 GOSUB 1000
30 PRINT #1,CHR$(27)"M";'ELITE
40 GOSUB 1000
50 PRINT #1,CHR$(15);'CONDENSED
60 GOSUB 1000
70 PRINT #1,CHR$(18);'CANCELS CONDENSED
80 PRINT #1,CHR$(27)"4";'ITALIC
90 GOSUB 1000
100 PRINT #1,CHR$(27)"5";'CANCELS ITALIC
110 END
1000 PRINT #1,"INVESTING IN THE RELIABLE 420i ";
1010 PRINT #1,CHR$(27)"G";'DOUBLE STRIKE
1020 PRINT #1,"PROVIDES LASTING DIVIDENS.";
1030 PRINT #1,CHR$(27)"H";'CANCELS DOUBLE STRIKE
1035 PRINT #1,CHR$(10) CHR$(13);
1040 RETURN
```

```
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
```

19. Termination of Double-strike

Refer to 18.

20. **ESC X** High quality

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"F";'PICA
20 FOR I=1 TO 2
30 GOSUB 100
40 PRINT #1,CHR$(27)"X"CHR$(1);'HIGH QUALITY
50 GOSUB 100
60 PRINT #1,CHR$(27)"X"CHR$(0);'CLEARS HIGH QUALITY
70 PRINT #1,CHR$(27)"M";'ELITE
80 NEXT I
90 END
100 PRINT #1,"INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS."
105 PRINT #1,CHR$(10);
110 RETURN
```

```
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
INVESTING IN THE RELIABLE 420i PROVIDES LASTING DIVIDENS.
```

21. **ESC v n** High quality ON/OFF

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"x" CHR$(1) 'SELECT HIGH QUALITY
20 PRINT #1,"HIGH QUALITY" CHR$(10)
30 PRINT #1,CHR$(27)"x"CHR$(0) 'CLEAR HIGH QUALITY
40 PRINT #1,"HIGH QUALITY OFF"
50 END
```

```
HIGH QUALITY
HIGH QUALITY OFF
```


22. **ESC 4** Italic

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,"INVESTING IN THE RELIABLE 420i ";
20 PRINT #1,CHR$(27)"4";'ITALIC
30 PRINT #1,"PROVIDES LASTING DIVIDENDS."
40 PRINT #1,CHR$(27)"5";'CANCELS ITALIC
50 END
```

INVESTING IN THE RELIABLE 420i *PROVIDES LASTING DIVIDENDS.*

23. **ESC 5** Termination of Italic

Refer to 22.

26. **SO** Double width

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(14);'DOUBLE WIDTH
20 PRINT #1,"EPSON ";
30 PRINT #1,CHR$(20);'CLEARS DOUBLE WIDTH
40 PRINT #1,"BUSINESS PRINTER ";
50 PRINT #1,CHR$(14)"420i"CHR$(10)
60 PRINT #1,"YOU CAN SEE THE DOUBLE WIDTH IS CLEARED AFTER A LINE FEED."
70 END
```

```
EPSON BUSINESS PRINTER 420i
YOU CAN SEE THE DOUBLE WIDTH IS CLEARED AFTER A LINE FEED.
```

27. **ESC SO** Double-width

Refer to 26.

26. **DC4** Termination of double-width

Refer to 26.


29. **ESC W** Double width

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"W1";'DOUBLE WIDTH
20 PRINT #1,"WE LOVE THE 420i" CHR$(10)
30 PRINT #1,"DOUBLE WIDTH NOT CLEARED AFTER LINE FEED."
40 PRINT #1,CHR$(27)"W0";'CLEARS IT
50 END
```

```
WE LOVE THE 420i
DOUBLE WIDTH NOT CLEARED AFTER
LINE FEED.
```


30. **ESC K** Standard graphic

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"K"CHR$(0)CHR$(2);'STANDARD GRAPHICS
20 FOR M=1 TO 2
30 FOR I=0 TO 255
40 PRINT #1,CHR$(I);
50 NEXT I
60 NEXT M
70 PRINT #1,CHR$(10)
80 END
```




31. **ESC L** Double-density graphic

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
5 PRINT #1,CHR$(9)CHR$(9)CHR$(9);'HORIZONTAL TAB
10 PRINT #1,CHR$(27)"L"CHR$(0)CHR$(2);'DOUBLE DENSITY GRAPHICS
20 FOR M=1 TO 2
30 FOR I=0 TO 255
40 PRINT #1,CHR$(I);
50 NEXT I
60 NEXT M
70 PRINT #1,CHR$(10)
80 END
```



32. **ESC k** High density graphic

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"k"CHR$(0)CHR$(1);'HIGH DENSITY GRAPHICS
30 FOR I=0 TO 255
40 PRINT #1,CHR$(I)CHR$(I);
50 NEXT I
70 PRINT #1,CHR$(10)CHR$(10)CHR$(10)
80 END
```



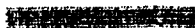







33. **ESC * m n1 n2** Selected density dot graphics

```


1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR M=0 TO 7
20 PRINT #1,"MODE # ";M;TAB(20);
30 IF M=7 GOTO 100
40 PRINT #1,CHR$(27)"*" CHR$(M) CHR$(120) CHR$(0);
50 FOR X=1 TO 60
60 PRINT #1, CHR$(85) CHR$(42);
70 NEXT X
80 LPRINT
90 NEXT M
100 PRINT #1,CHR$(27)"*" CHR$(M) CHR$(0) CHR$(1);
110 FOR I=0 TO 255
120 PRINT #1,CHR$(85) CHR$(42);
130 NEXT I
140 PRINT #1,CHR$(10) CHR$(10) CHR$(10)
150 END

```

MODE #	0	
MODE #	1	
MODE #	2	
MODE #	3	
MODE #	4	
MODE #	5	
MODE #	6	
MODE #	7	


34. **ESC Y n1 n2** High-speed, double-density dot graphics

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"Y" CHR$(0) CHR$(2);'DOUBLE DENSITY GRAPHICS
20 FOR M=1 TO 2
30 FOR I=0 TO 255
40 PRINT #1, CHR$(I);
50 NEXT I
60 NEXT M
70 PRINT #1, CHR$(10)
80 END
```



35. **ESC Z n1 n2** Quadruple-density dot graphics

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"Z" CHR$(0) CHR$(2);'QUAD DENSITY GRAPHICS
20 FOR M=1 TO 2
30 FOR I=0 TO 255
40 PRINT #1, CHR$(I);
50 NEXT I
60 NEXT M
70 PRINT #1, CHR$(10)
80 END
```



36. **ESC D** Horizontal tab setting

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,"012345678901234567890123456789"CHR$(10)
20 PRINT #1,CHR$(27)"D"CHR$(5)CHR$(10)CHR$(20)CHR$(29)CHR$(0);'HORIZONTAL TABS
30 FOR I=1 TO 4
40 PRINT #1,CHR$(9)"TAB";'MOVE TO TAB
50 NEXT I
60 PRINT #1,CHR$(0)
70 END

```

```

012345678901234567890123456789
    TAB TAB      TAB      TAB

```

37. **HT** Horizontal tab

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
5 PRINT #1,"012345678901234567890123456789"CHR$(10)
10 FOR I=1 TO 16
20 PRINT #1,CHR$(9)"TAB";'GO TO DEFAULT TAB
30 NEXT I
40 PRINT #1,CHR$(10)
50 END

```

```

0123456789012345678901234567890
TAE TAB TAB TAE TAE TAB TAB TAE TAB TAB TAB TAB TAB TAB TAB TAB TAB TAB TAB

```

38. **ESC Q** Right margin

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"Q"CHR$(70);'RIGHT MARGIN AT 70TH COLUMN
20 FOR I=1 TO 3
30 FOR M=1 TO 8
40 PRINT #1,"0123456789";
50 NEXT M
60 PRINT #1,CHR$(10)
70 NEXT I
80 END

```

```

01234567890123456789012345678901234567890123456789012345678901234567890123456789
0123456789
01234567890123456789012345678901234567890123456789012345678901234567890123456789
0123456789
01234567890123456789012345678901234567890123456789012345678901234567890123456789
0123456789

```

39. **ESC I** Left margin

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"I"CHR$(15);'LEFT MARGIN
20 PRINT #1;"MOST OF US KNOW"CHR$(10)
30 PRINT #1;"THE EARTH IS"CHR$(10)
40 PRINT #1;"BIGGER THAN THE MOON."CHR$(10)
50 PRINT #1,CHR$(27)"I"CHR$(0);'RESET LEFT MARGIN
60 PRINT #1;"I LOVE"CHR$(10)
70 PRINT #1;"ELISABETH."
80 END

```

```

MOST OF US KNOW
THE EARTH IS
BIGGER THAN THE MOON.

```

```

I LOVE
ELISABETH.

```

40. **ESC C** Page length in lines

```
1 OPEN "LPT1;" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"C"CHR$(10);'10 LINES FOR PAGE LENGTH
20 PRINT #1,"PAGE 1"CHR$(10)CHR$(10)
30 PRINT #1,"PRINT WHATEVER YOU WANT !"
40 PRINT #1,CHR$(12);'FF CODE
50 PRINT #1,"PAGE 2"CHR$(12)
60 PRINT #1,"PAGE 3"
70 END
```

PAGE 1

PRINT WHATEVER YOU WANT !

PAGE 2

PAGE 3

41. **ESC C 00** Page length in inches

Refer to 3.

42. **ESC B** Vertical tab setting

Refer to 4.

43. **ESC b**

Channel vertical tab setting

```

1 OPEN "LFT1:" AS #1
2 WIDTH #1,255
10 'VERTICAL TAB SETTINGS IN CHANNEL 3 IN FEED
20 PRINT #1,CHR$(27)"C"CHR$(0)CHR$(3);'3 INCHES FOR PAGE LENGTH
30 PRINT #1,CHR$(27)"b"CHR$(2)CHR$(1)CHR$(10)CHR$(12)CHR$(0);
40 'VERTICAL TABS IN CHANNEL 2 ARE SET AT 2ND, 11TH AND 13TH LINES
50 PRINT #1,CHR$(27)"/"CHR$(2);'CHANNEL 2 SELECTED
60 FOR I=1 TO 2
70 PRINT #1,"FIRST LINE"CHR$(11);
80 PRINT #1,"SECOND LINE"CHR$(11);
90 PRINT #1,"11TH LINE"CHR$(11);
100 PRINT #1,"13TH LINE"CHR$(11);
110 NEXT I
200 'VERTICAL TAB SETTINGS IN CHANNEL 4
210 PRINT #1,CHR$(27)"b"CHR$(4)CHR$(3)CHR$(7)CHR$(14)CHR$(0);
220 'VERTICAL TABS IN CHANNEL 4 SET AT 4TH, 8TH AND 15TH LINES.
230 PRINT #1,CHR$(27)"/"CHR$(4);'CHANNEL 2 SELECTED
240 FOR I=1 TO 2
250 PRINT #1,"FIRST LINE"CHR$(11);
260 PRINT #1,"4TH LINE"CHR$(11);
270 PRINT #1,"8TH LINE"CHR$(11);
280 PRINT #1,"15TH LINE"CHR$(11);
290 NEXT I
300 END
    
```

FIRST LINE
SECOND LINE

11TH LINE
13TH LINE

FIRST LINE
SECOND LINE

11TH LINE
13TH LINE



FIRST LINE

4TH LINE

8TH LINE

15TH LINE

FIRST LINE

4TH LINE

8TH LINE

15TH LINE

44. **ESC /**

Channel selection of vertical tab

45. **ESC 0** 1/8 inch line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"0";'1/8
20 PRINT #1,"ESC 0"CHR$(10)
30 PRINT #1,"ESC 0"CHR$(10)
40 PRINT #1,"ESC 0"CHR$(10)
50 END
```

```
ESC 0
ESC 0
ESC 0
```

46. **ESC 1** 7/60 inch line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"1";'7/60 INCHES LINE FEED
20 PRINT #1,"ESC 1"CHR$(10)
30 PRINT #1,"ESC 1"CHR$(10)
40 PRINT #1,"ESC 1"CHR$(10)
50 END
```

```
ESC 1
ESC 1
ESC 1
```

47. **ESC 2** 1/6 inch line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"2";'1/6 INCH LINE FEED
20 PRINT #1,"ESC 2"CHR$(10)
30 PRINT #1,"ESC 2"CHR$(10)
40 PRINT #1,"ESC 2"CHR$(10)
50 END
```

```
ESC 2
ESC 2
ESC 2
```

48. **ESC 3 n** n/180 inch line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=20 TO 100 STEP 20
20 PRINT #1,CHR$(27)"3"CHR$(I);'LINE FEED LENGTH SETTING
30 PRINT #1,"VARIABLE LINE SPACING"CHR$(10)
40 NEXT I
50 END
```

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

49. **ESC A n** n/60 inch line feed

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=15 TO 60 STEP 15
20 PRINT #1,CHR$(27)"A"CHR$(I);'LINE FEED LENGTH SETTING
30 PRINT #1,"VARIABLE LINE SPACING"CHR$(10)
40 NEXT I
50 END
```

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

50. **ESC**.n n/120 line spacing

```
1 OPEN "LPT1:" AS #1
```

```
2 WIDTH #1,255
```

```
10 FOR I=20 TO 100 STEP 20
```

```
20 PRINT #1,CHR$(27)".CHR$(I) 'LINE FEED LENGTH SETTING
```

```
30 PRINT #1,"VARIABLE LINE SPACING" CHR$(10)
```

```
40 NEXT I
```

```
50 END
```

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

VARIABLE LINE SPACING

51. **ESC** — Underline

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"-1";'UNDERLINE
20 PRINT #1,"MY FAIR LADY";
30 PRINT #1,CHR$(27)"-0";'CLEAR UNDERLINE
40 PRINT #1," , ELISABETH !"CHR$(10)
50 PRINT #1,CHR$(27)"-1";'UNDERLINE
60 PRINT #1,"YOUR FAVORITE LADY,";
70 PRINT #1,CHR$(9);'HORIZONTAL TAB
80 PRINT #1,"YOKO-SAN"CHR$(10)
90 END

```

MY FAIR LADY, ELISABETH !
YOUR FAVORITE LADY, YOKO-SAN

52. **CAN** Buffer clear

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"4";'ITALIC
20 PRINT #1,"ABCDEF";
30 PRINT #1,CHR$(24);'BUFFER CLEAR C
40 PRINT #1,"GHIJK"CHR$(10)
50 END

```

GHIJK

53. **BS** Back space

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,"THIS COST ME Y";
20 PRINT #1,CHR$(8);'BACK SPACE
30 PRINT #1,"=10,000.-"CHR$(10)
40 END

```

THIS COST ME ¥10,000.-

54. **ESC =** 8th bit 0 (Epson only)

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"=";'8TH BIT 0
20 FOR I=32 TO 95
30 PRINT #1,CHR$(I);
40 NEXT I
50 PRINT #1,CHR$(10)
60 FOR I=160 TO 223
70 PRINT #1,CHR$(I);
80 NEXT I
90 PRINT #1,CHR$(10)
100 END

```

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOQRSTUVWXYZ[\]^_`
!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMNOQRSTUVWXYZ[\]^_`

55. **ESC >** 8th bit 1 (Epson only)

```

1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)">";'8TH BIT 1
20 FOR I=32 TO 95
30 PRINT #1,CHR$(I);
40 NEXT I
50 PRINT #1,CHR$(10)
60 FOR I=160 TO 223
70 PRINT #1,CHR$(I);
80 NEXT I
90 PRINT #1,CHR$(10)
100 END

```

#####@B`Qµ\$AA0δU000\$E0\$↑↓↔δi;ǀNŃŃtEæ0ø[\]^` (1)~
#####@B`Qµ\$AA0δU000\$E0\$↑↓↔δi;ǀNŃŃtEæ0ø[\]^` (1)~

1
2
3
4
5
6
7
8

52
53
54
55
56

57
1
2
3
4
5

53
54
55
56
57

56. **ESC O** Termination of skip-over perforation

Refer to 57.

59. **DEL** Data delete

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,"HHHX";
20 PRINT #1,CHR$(127);'DELETE CODE
30 PRINT #1,"HHH"CHR$(10)
40 END
```

HHHHHH

60. **ESC <** Home positioning

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 FOR I=1 TO 3
20 PRINT #1,"ABC"CHR$(10);
30 NEXT I
40 PRINT #1,CHR$(27)"<";'HEAD TO HOME POSITION
45 FOR I=1 TO 3000:NEXT I
50 PRINT #1,"XYZ"CHR$(10)
60 END
```

```
ABC
  ABC
    ABC
      XYZ
```

61. **ESC R** International character (Epson only)

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"R"CHR$(0);'USA FONT
20 GOSUB 100
30 PRINT #1,CHR$(27)"R"CHR$(1);'FRANCE FONT
40 GOSUB 100
50 PRINT #1,CHR$(27)"R"CHR$(7);'SPAIN FONT
60 GOSUB 100
70 END
100 PRINT #1,CHR$(35)CHR$(36)CHR$(64)CHR$(91)CHR$(92)CHR$(93)CHR$(94)CHR$(96)
CHR$(123)CHR$(124)CHR$(125)CHR$(126)CHR$(10)
110 RETURN
```

```
##@[ \ ] ^ * ( ) ~
##$a"q8""eue
##@iñç""ñ)~
```

62. **BEL** Buzzer

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(7);'SOUND BUZZER
20 FOR I=1 TO 1000:NEXT I
30 PRINT #1,CHR$(7);'RING BUZZER
40 END
```

63. **ESC @** Reset

```
1 OPEN "LPT1:" AS #1
2 WIDTH #1,255
10 PRINT #1,CHR$(27)"@ABCD"CHR$(10)
20 END
```

ABCD

APPENDIX

INPUT DATA DUMP IN HEXADECIMAL

There is a function of printing input data from a computer in hexadecimal codes. Therefore, it is possible to check the data the printer has received. To perform this function, keep pushing both the LF and the FF switches at power-on till the initialization operation ends. Hereafter, 16 bytes of input data will be printed a line at a time due to the function of the automatic printing provided. If the number of input data is less than 16 bytes and it is necessary to print them all, press the ON-LINE switch.

After printing, push the ON-LINE switch again to return to the dump function from the OFF-LINE state. This function can be terminated by either of the 3 ways shown below.

- (1) Turn power off, wait 2 seconds and then turn it back on again.
- (2) Push the RESET switch.
- (3) Input the INITIAL signal.

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